

Is the Big Twin more economical than the 3½ h.p. Single?

Motor Cycling



No. 309.

TUESDAY, 12th October, 1915
Registered at the G.P.O. as a Newspaper.

Vol. XII.

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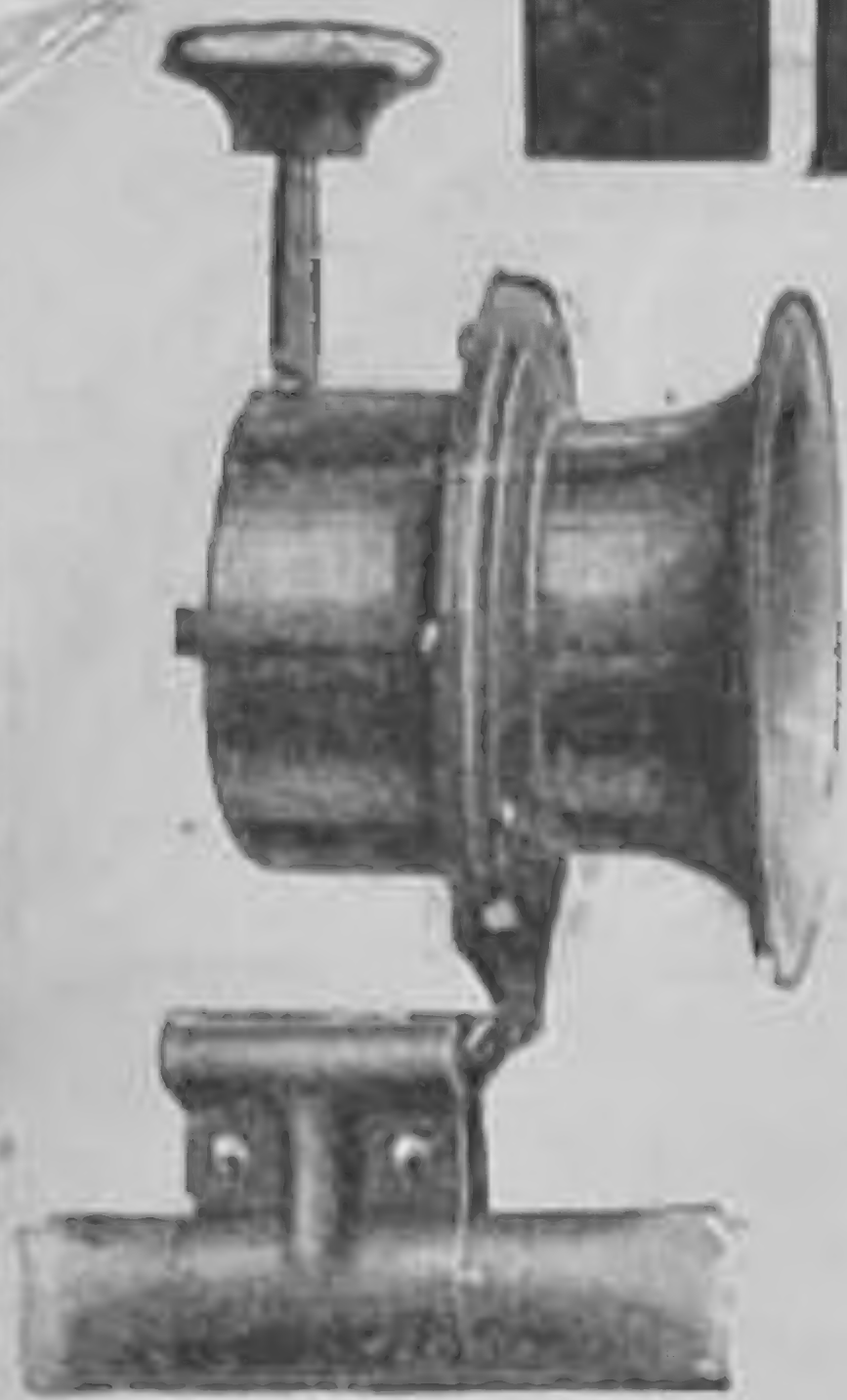
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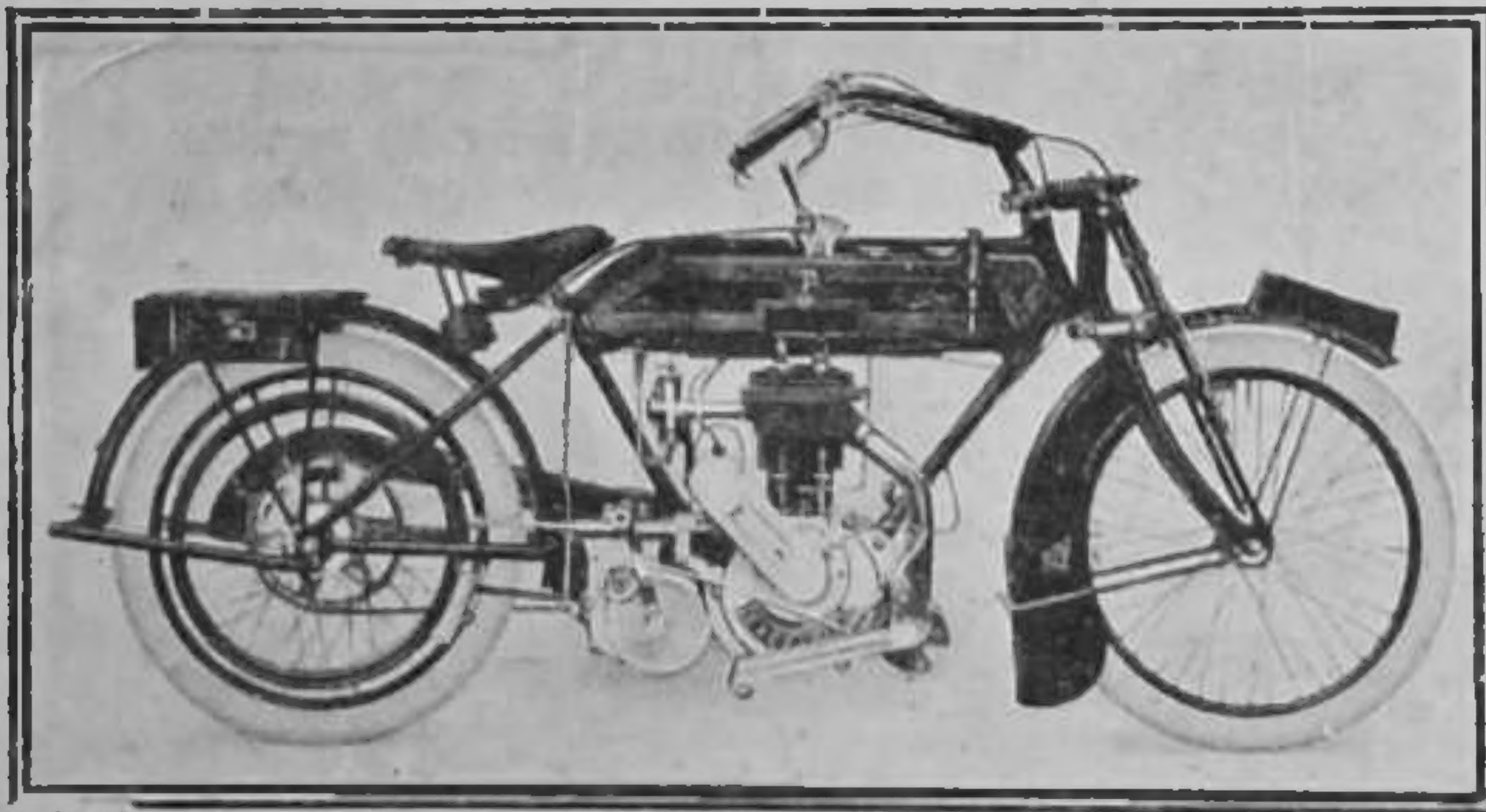
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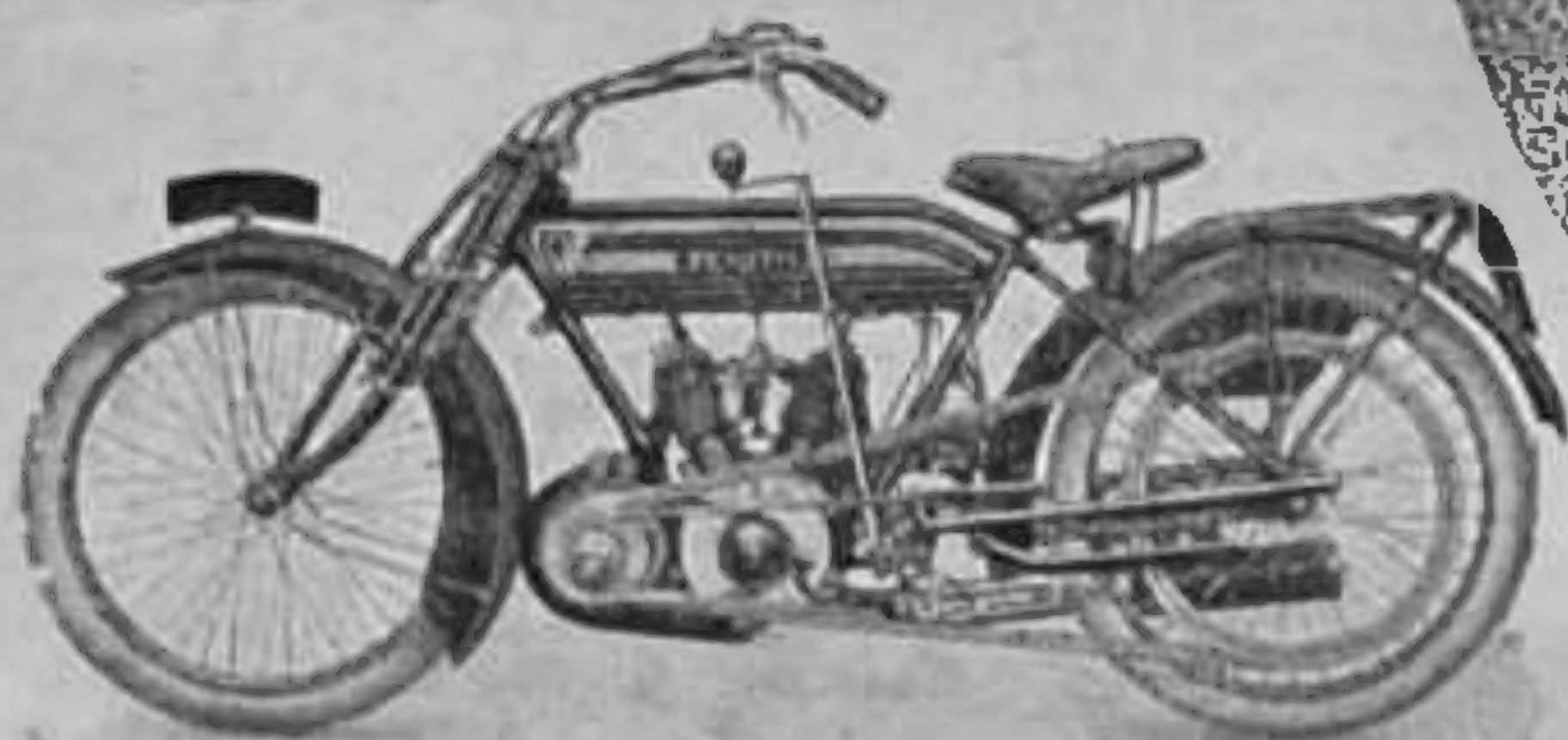
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C.S.L. in "The Motor Cycle Trader," 17th Sept., 1915.

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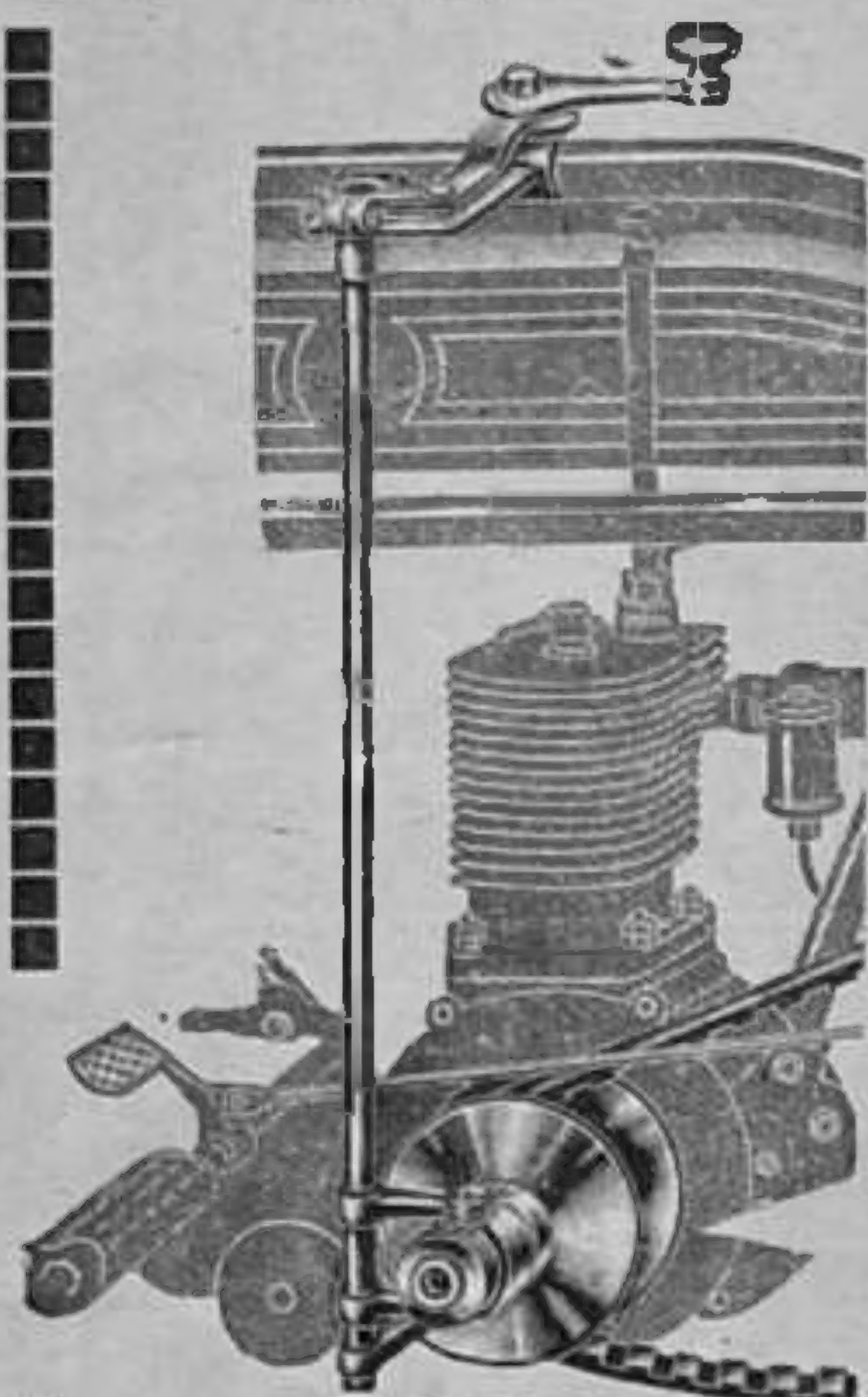
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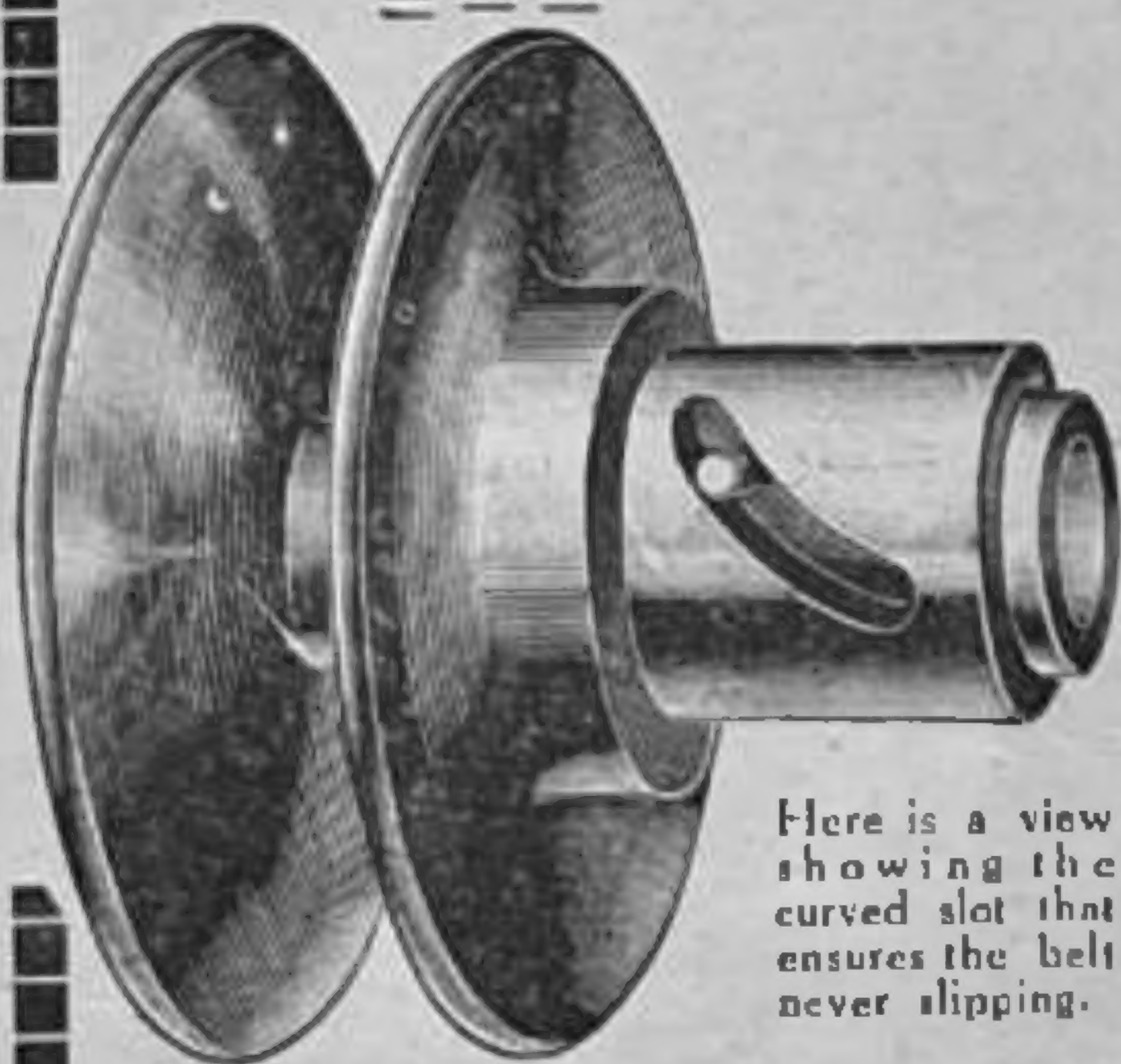
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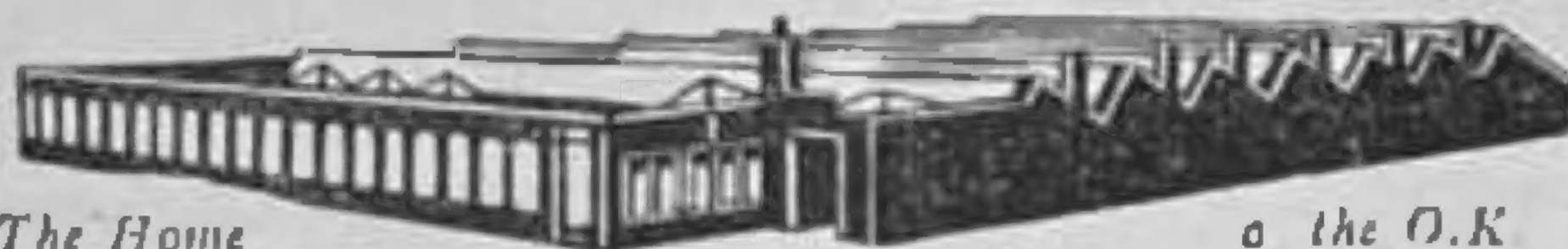
"is the most economical and reliable machine of its class . . . I have covered some 2,000 miles without any engine trouble. . . I can do 130 to 145 m.p.h. . . its speed ranges from 2 to 45 m.p.h. . . I have sometimes carried a 10-stone passenger on the carrier . . . the engine after a 100 miles run-stop, is as cool as if it had only done 50 . . . when I took it down after 2,000 miles I found no sign at all of wear."

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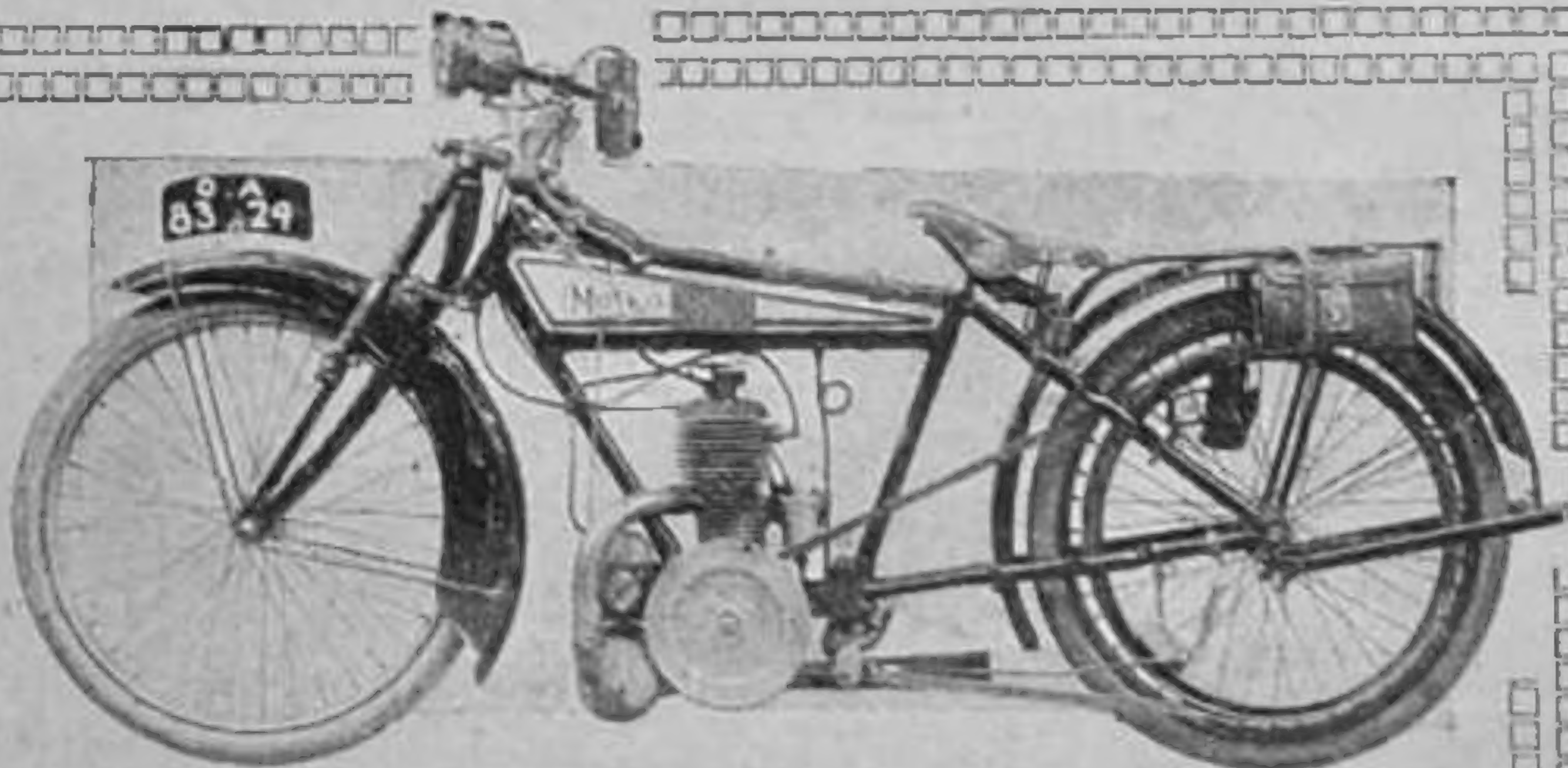
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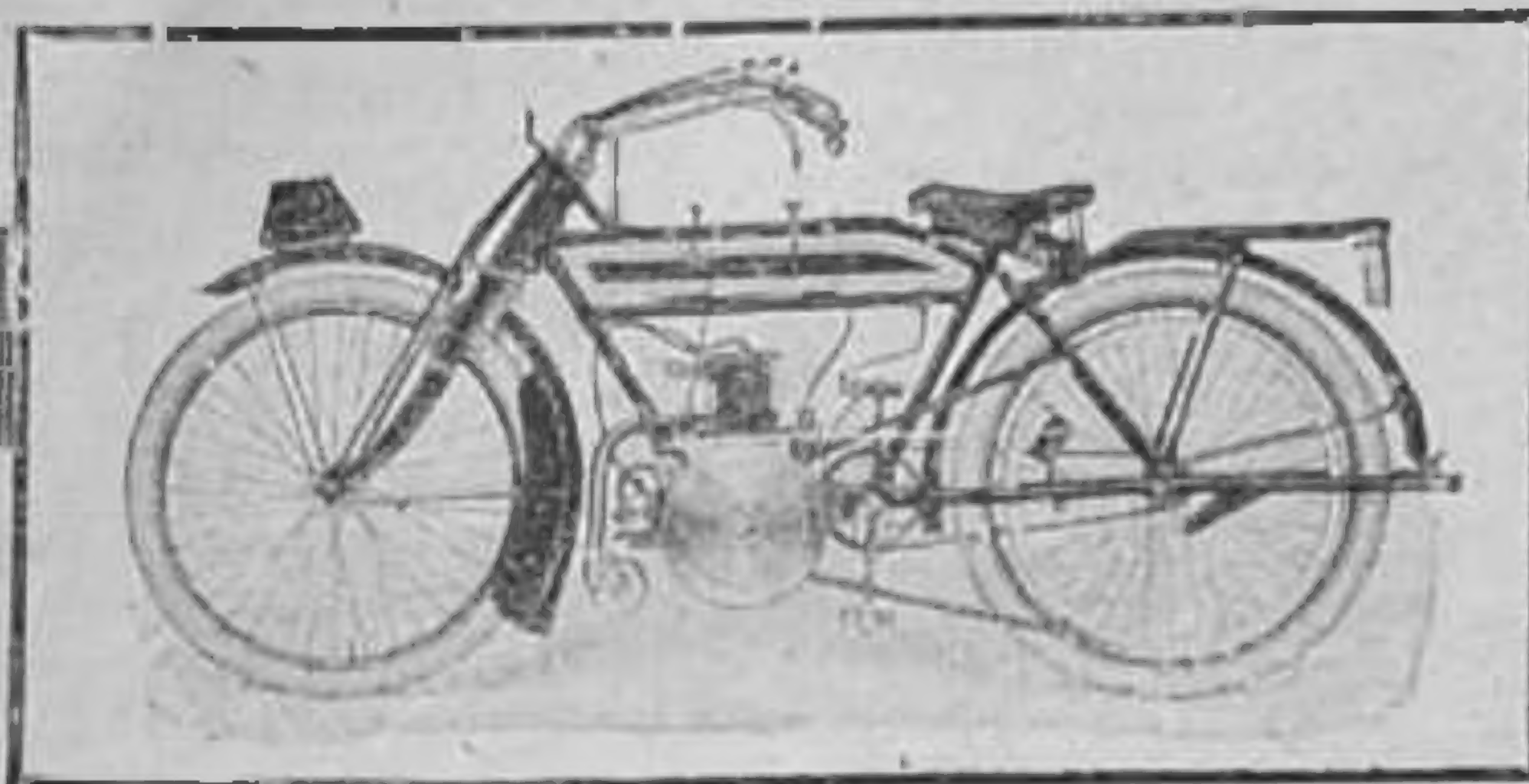
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London—58, Holborn Viaduct, E.C.

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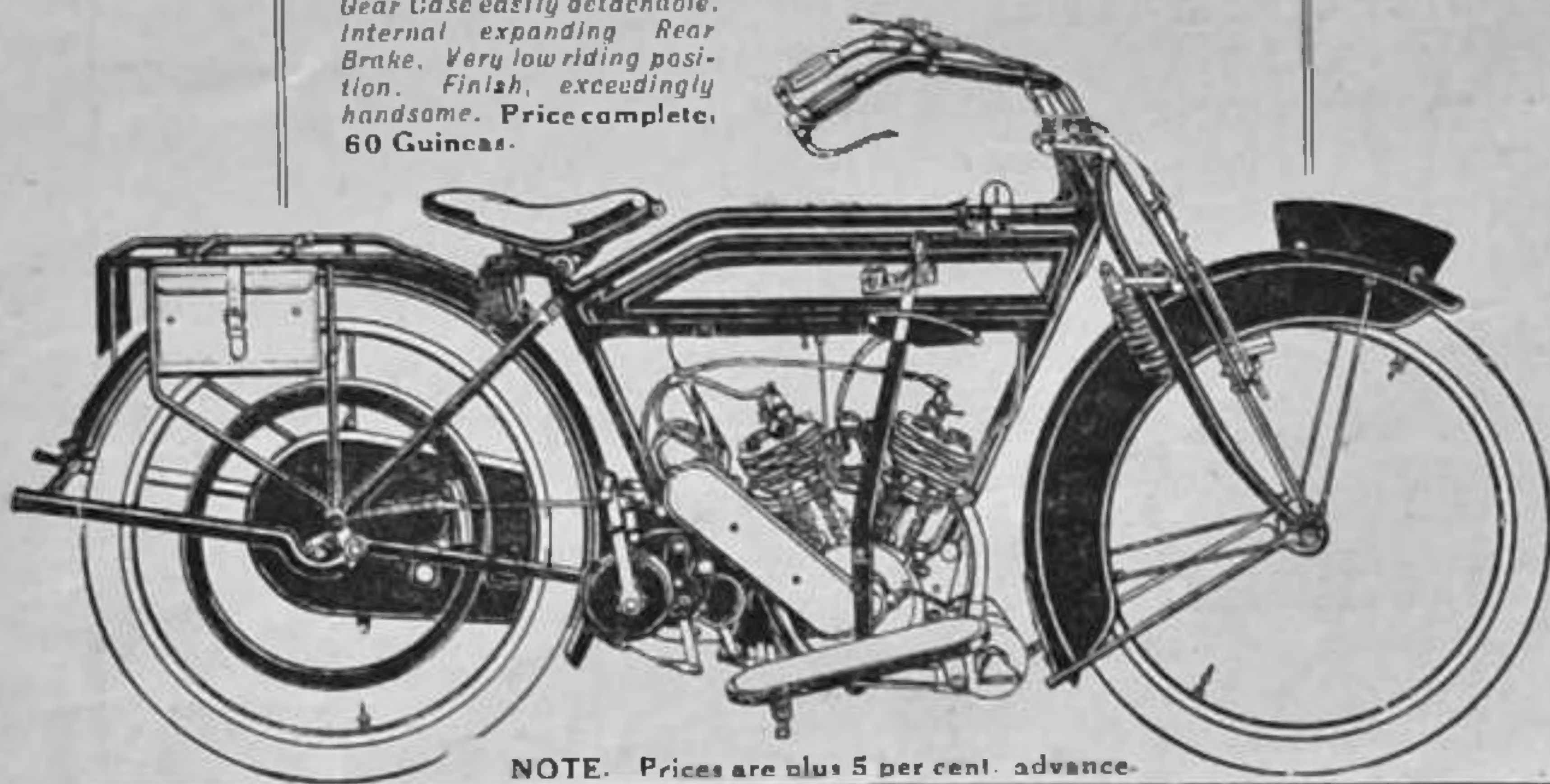
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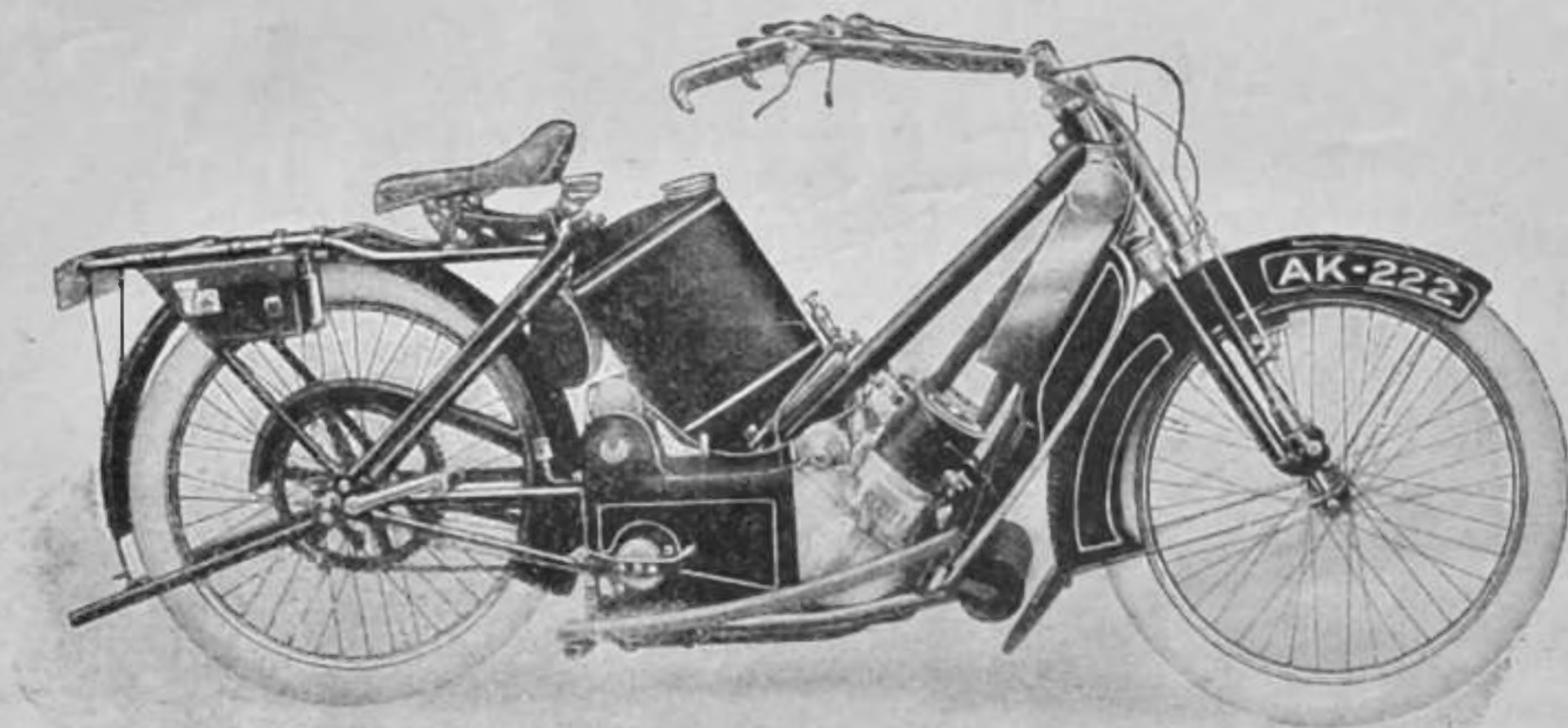
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THE TWO-STROKE SCOTT.

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MotorCycling

A Newspaper for Motorcyclists only

Edited, Written, and Illustrated
by
A STAFF OF
PRACTICAL
MOTORCYCLISTS.

Offices: 7-15, ROSEBERY
AVENUE, LONDON, E.C.

AUXILIARY MOTOR DEVELOPMENTS.

A Coming "Boom" in Bicycle Attachments.

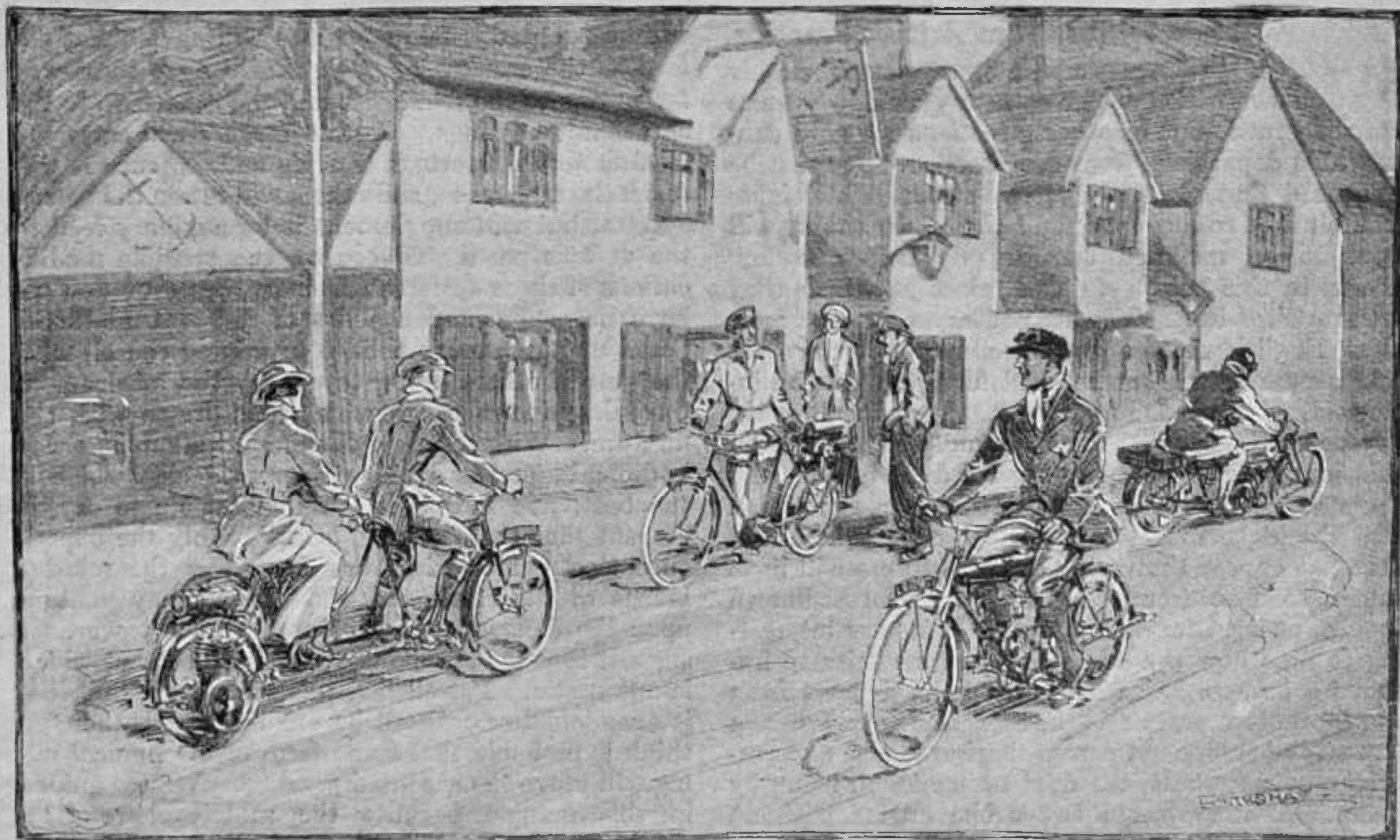
IT is practically certain that the next few months will mark the commencement of a boom in auxiliary motor attachments for bicycles. Few can have failed to notice the very great increase in the number in use of the first and most popular of this type, the Wall Auto-Wheel, while the introduction of other devices has attracted very great attention from cyclists.

Attachments of this character for ordinary bicycles hardly appeal to the practised motorcyclist, but it must be remembered that there are hundreds of thousands of cyclists who would find auxiliary motor power, especially if in a form that can be readily attached and detached, of the greatest service, and no doubt many are ardent readers of this journal. The facility with which the Auto-Wheel can be fitted to any type of machine, bicycle, tandem, tricycle or the increasingly popular bicycle sidecar outfit, has been a great point in its favour, but other attach-

ments on different lines, like those we describe this week, will widen the circle of those to whom auxiliary motor power appeals. The attention being given to these devices in America is noteworthy.

Undoubtedly, in lieu of a show, we shall have to organize another rally to display these various attachments and to demonstrate to cyclists what can be done to convert their bicycles into power-driven machine with a minimum of trouble.

In co-operation with our sister journal "Cycling," we have closely followed and encouraged auxiliary motor attachments, and while "Cycling" will be the means of introducing the various types to the notice of cyclists, the more technical aspect of this important development will be treated in our pages, as it is undoubtedly the first rung of the motoring ladder, followed, of course, by the motorcyclette movement which we also inaugurated.



It will soon be a common sight to see most cyclists with some form of auxiliary motor attachment like the different types illustrated above.

The Country's Call.

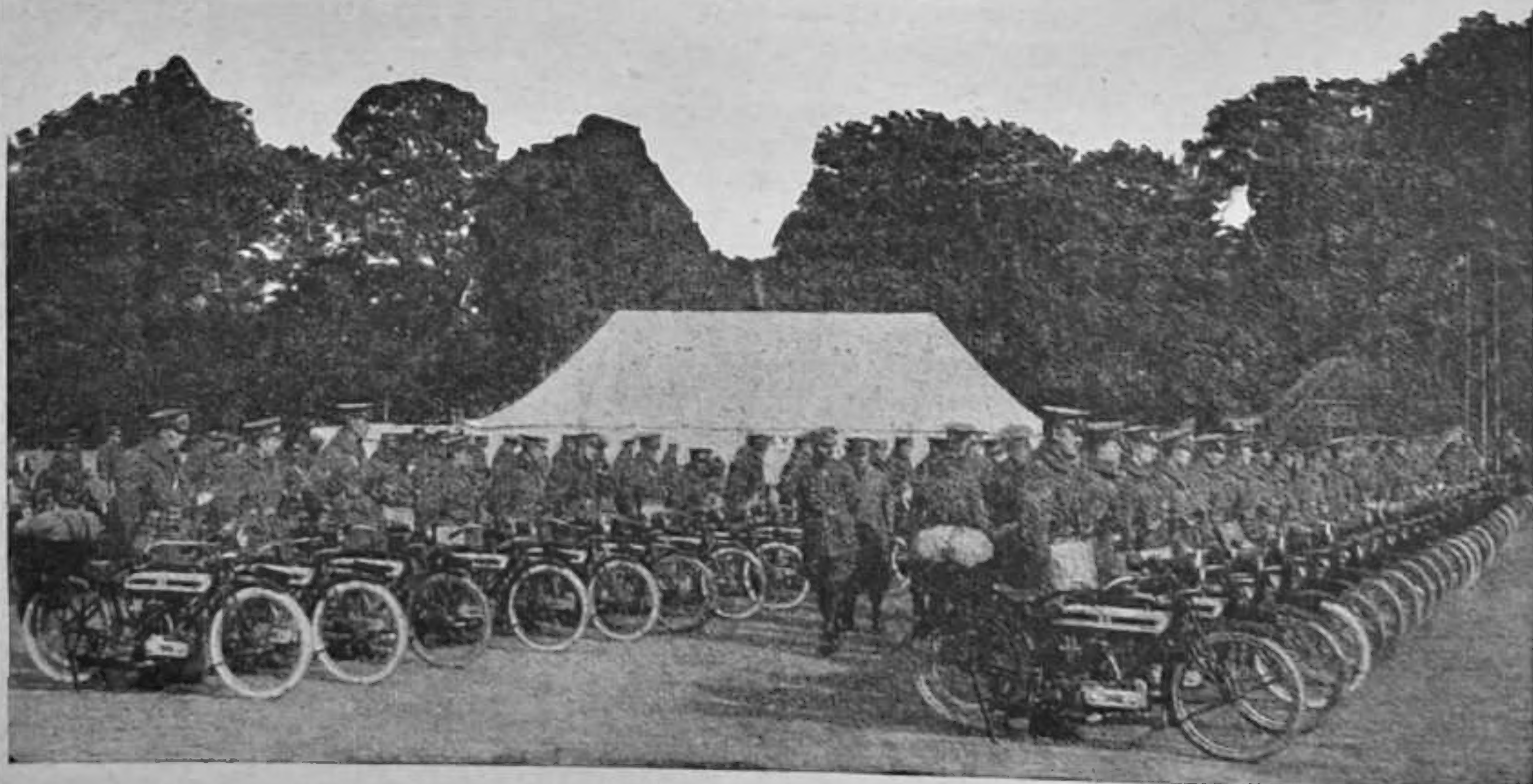
No arm in the service has figured more prominently or with greater distinction than the Motor Cycle Despatch Rider in this world struggle of the nations, and no motor has shown greater adaptability from peace to war conditions, and proved its great superiority under the unparalleled conditions prevailing, than the Trusty Triumph

Triumph Cycle Co., Ltd., Coventry.

LONDON: 4-5, Holborn Viaduct, E.C.
MANCHESTER: 160, Deansgate.

LEEDS: 53, Vicar Lane.
GLASGOW: 14, Waterloo St.

TRIUMPH



EDITORIAL

America's Latest Departure—A Boom in Two-strokes and Motorcyclettes—Changes in Two-stroke Lubrication Systems.

American Two-strokes.

AMONG the surprises that have been prepared for the 1916 season is the entry of American manufacturers into the motorcyclette industry. Until now, British riders have been accustomed to class all American makes under the heading of high-powered machines suitable for sidecar work. They know that in the United States 1000 c.c. motorcycles are used for solo work, and have wondered why the lighter and lower-powered mounts have not made more progress over there. They may have supposed that American roads are so bad that high-powered machines are necessary, but this is not altogether the case. The well-known American makes that find a sale in this country are used almost exclusively for passenger work, and in this field they have been comparatively successful, but over here our manufacturers have held a practically undisputed position in the solo machine market. The modern motorcyclette has been developed in this country and has had no serious rival. But apparently it is no longer to have the field to itself, for, as our report of the Chicago Show proves, American manufacturers are now devoting considerable attention to two-stroke motorcyclettes.

And How They Differ From British Practice.

MOST of the American motorcyclettes closely follow British design so far as the power units are concerned, but in other directions we note considerable departures from our practice. It must be confessed that some of the two-stroke lightweights look clumsy to our eyes, and these, we think, will have to be modified considerably before finding favour in this country. The prices at which they are marketed in America are not below those of first-class English makes, and presumably if they are sold over here the sums asked for them will be increased, owing to the new tariff. The models made by concerns that are already soundly established in this country will undoubtedly find a ready sale, and these small mounts will benefit by the reputation that the higher-powered machines have gained. It does not appear that home manufacturers will have much to fear from the rivalry of lesser-known makes, at least for a long time. It is very interesting to note how the American designer tries to improve a two-stroke machine when he departs from our accepted practice. For example, one has a two-stroke engine set across the frame and a worm-driven countershaft, the final transmission being by chain. Another has a two-stroke engine with an auxiliary valve. Doubtless, as so much interest is being taken on both sides of the Atlantic in the development of these interesting machines, they will

soon be brought to an even greater state of perfection than they have yet reached, and new experiments will be watched keenly.

Two-stroke Lubrication Changes.

IT is noticeable that makers of two-stroke machines have been devoting considerable attention to the important question of lubrication. The models for 1916 show that, while a great deal of thought has been devoted to the subject, designers have widely divergent ideas. The petroil system will, of course, continue to be used, as it has proved extremely successful and has the advantage of being so simple that the novice never has to give a thought to it. Some manufacturers, however, have found that unless a very considerable amount of oil is added to the petrol—enough, in fact, to keep the exhaust smoking—the main bearings and big and little ends do not receive sufficient lubrication to keep them "floating." Thus undue wear is likely to take place, which, in the case of the main shaft bearings, is a serious fault, as it may result in loss of crankcase compression. Many makers have, therefore, been at work upon the problems involved, and so some of the latest motorcyclettes will be considerably altered next season. Many different methods will be adopted. Some engines will have direct oil-feed to the crankcase. Others will have three-way feeds, one to the crankcase and the other two to the crankshaft bearings. Certain makers will carry the oil first to the bearings and big end, whence it will reach the crankcase, and others will retain the petroil system, but will supplement it by auxiliary feed to the various parts. Of course, the possible modifications of these systems are many, but even now we have not exhausted the list of different methods. Some manufacturers believe in mixing the oil with the petrol, others prefer to convey the lubricant to the inlet pipe, through which it is drawn with the mixture. With so many divergent systems in use it is difficult for the average rider to decide which is the best, and indeed it is only possible to say at present that there is no "best." Only the experience that comes with time can show the relative merits of the rival methods. If we may venture upon the dangerous task of prophecy, however, we suggest that the surviving system will be that which is automatic. Petroil had this advantage, and if it is abandoned or assisted by auxiliary feed, then we think it probable that some form of mechanical oiling will prove the accepted practice. We are guided in this opinion because the motorcyclette is a machine eminently suitable for the beginner, and the simpler it is to manage the more satisfaction it will give.

NOT ALWAYS CARBURATION.

The Real Causes of High Petrol Consumption.

The writer of the following article, which will be concluded next week, has had recently opportunities of testing the consumption of nearly every make of machine, usually when tuned by the manufacturers to give the best results. In his opinion, the 3½ h.p. sidecar combination is more extravagant of petrol than bigger outfits, but probably the same conclusions could not be arrived at with regard to tyres and other items of running costs. In a further article, he will deal with the mechanical problem of reducing the bill for fuel.

I.—THE PROBLEM OF THE 3½ H.P. SIDECAR OUTFIT.

TIME was when a discussion on petrol economy, in so far as motorcycles were concerned, would have been looked upon as an unpardonable triviality. But, tempora mutantur, in fact, exceedingly mutantur in this respect, the subject has now assumed proportions which demand immediate attention.

The causes of heavy petrol consumption may be roughly grouped under three headings:—1. Disproportion of the power to the load; 2, bad valve timing, with perhaps indifferent induction and exhaust systems, and 3, defective carburation.

Chief among the aggressors in the first class comes the single-cylinder 3½ h.p. with a heavy coachbuilt sidecar.

Now, such a remark at the commencement smacks suspiciously of the gauntlet being flung down to those manufacturers who specialize in this type of passenger combination; but such is by no means the intention of the writer, for, as many satisfied users can testify, the 3½ h.p. single, if of good design and kept up to concert pitch, is quite equal to its work in this respect.

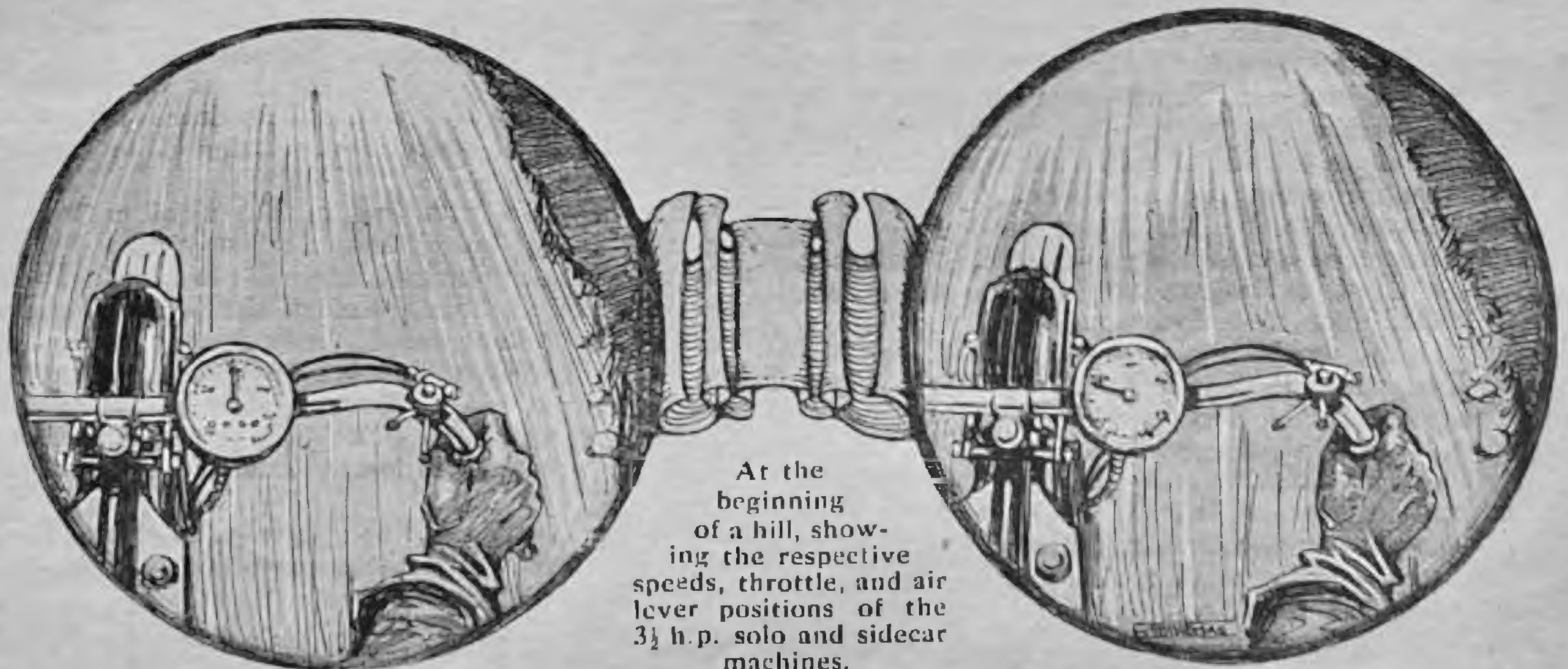
It is, however, equally certain that in the air-cooled 499 c.c. engine we have a proposition with which fast and loose cannot be played, for the reason that it is in the nature of an air-cooled single, with its highly inconstant torque, to reach the "konking" point under a heavy load more easily than will a twin of similar c.c.

Now, the average amateur knows nothing, and cares less, about the scientific aspect of konking, but al-

most every rider with a modicum of mechanical observation quickly makes two discoveries when he starts to use a 3½ h.p. single-cylinder combination. The first is that when the engine commences to knock he can cure it in two ways—by retarding his spark or by closing his air lever. He soon adds to his discovery another one, namely, that to cure it by the first means his power falls away so suddenly when on a hill that he is quickly obliged to change down to prevent his engine stopping, while if, au contraire, he keeps the spark well up, and in preference closes the air lever, all is immediately serene. Result: the air lever gradually ceases to be regarded as a means of preserving a perfect mixture, and comes to be looked upon simply as a "konk stopper."

Now, if the rider carries his observations still further, he will notice another interesting fact, that, as his engine rolls off its miles, the "konk stopper" requires to be operated more and increasingly more each journey he makes until his serenity gets rudely shaken one day by the discovery that on his pet hill the long-suffering air lever has failed him. If he is a man who troubles to note his mileage per gallon he will find that it has recently reached a figure quite out of proportion to the amount of power obtained from the engine.

The reason for all this can be disposed of in very few words. Konking is fundamentally produced by an explosion which develops too quickly for the immediate working conditions of the engine. Therefore, it is logically evident that any retarding agent will tend to cure it.



Not Always Carburation—(contd.).

Apart from structural alterations—which will be dealt with in due course—there are three ways in which to deal with this trouble:—1, Mechanically delaying the explosion by means of ignition; 2, slowing the flame rate by means of an abnormally enriched mixture, as in the above example; and 3, employing a fuel, such as benzole, either pure or mixed with petrol, which, while not materially altering the mean pressure, will prevent its sudden and violent development. Of these three, the first we can straight-away rule out as useless, for the reason that it destroys power, and tends enormously to overheat the engine.

The second, while it is quite effective from a horsepower standpoint, is obviously wasteful, and therefore an unscientific method of tackling the problem. The third is the ideal way, and if good benzole is used one can pull a sidecar with practically the same mixture as is used for solo work without any sign of knocking.

A 30 Per Cent. Increase.

So much for the theoretical aspect of the case; and now, what are the actual facts? There is more than one single $3\frac{1}{2}$ h.p. of reputable make which, when driven solo, will put up a three-figure consumption, but, attach a sidecar, and our 100 odd miles per gallon comes down to 40 or thereabouts, simply because, to avoid knocking, it is necessary to use a mixture 50 per cent. richer than should be chemically necessary. Scientifically viewed, all this is, of course, quite wrong, for, taking the normal solo consumption at 100 m.p.g., the additional weight should not reduce the figure by more than 30 per cent. at the outside, and any increase upon this is clearly the result of the use of abnormal mixtures.

Reference has been made to the means of dealing with the situation, other than by structural alterations, but to cure it effectively, given, of course, that the subject of our treatment is a $3\frac{1}{2}$ h.p. single-cylinder combination in which the principal waste is due to the "anti konk" petrol cure, a mechanical means must be found to tackle the problem, as benzole is apparently to be denied to us for the duration of the war.

First, the various causes which contribute to knocking must be examined, and of these high compression is probably the most usual. Although such a condition is quite compatible with the theory of internal combustion, and is admittedly necessary for high efficiency and economy, its effectiveness, be it noted, is only progressive up to the point where the engine knocks, and as the latter is variable according to conditions, the compression maximum should also be varied to avoid running foul of this line of limitation. Thus, a degree of compression which would be excellent on a high-speed solo mount, or on a twin that is never called upon to do heavy pulling of the "chug-chug" order, would be impossible as soon as the extra load of a sidecar is imposed upon it, and it is in this respect that designers are, in the author's opinion, a little shortsighted.

It is not intended to suggest that T.T. compressions are used in combination work, but that, with the 499 c.c. single-cylinder touring engine, the ordinary solo compression ratios themselves are in many cases too great, and the provision of a suitable means of lowering them might be marketed

with advantage by those makers whose standard compression is too high for combination work.

Meanwhile, the best course for those who possess $3\frac{1}{2}$ h.p. single-cylinder passenger machines, which require a heavy mixture, is to reduce to the utmost by every means any tendency to overheat or knock, for the one is generally a preliminary to the other, and when these troubles set in economical driving is quite out of the question.

The query now arises by how much must the compression be lowered to effect this without destroying the "vim" of the engine? There a little judgment is necessary, for it will in this case depend upon whether the engine has always—even when new—knocked on a normal mixture or whether that tendency was of more recent development. If the latter is the case, it is probable that the cause, in the more immediate sense, is due to carbonization, which acts in a three-fold manner, to wit—by raising the compression by interfering with radiation, and by producing a pre-ignition tendency. In this connection it is well to remember that when decarbonizing the combustion head the underside of the piston, as well as the top, should always be scraped, for if the crown is too thin, which is not infrequently the case, there is a great tendency to a thick accumulation here, which prevents the piston radiating its heat, and is a most prolific cause of pre-ignition.

The Importance of Decarbonizing.

If, now, we start with a clean engine, it only remains to note the distance we can go and the amount of carbon which must accumulate before the old symptoms become evident, and we can roughly estimate from that observation the extent to which the compression is too high, for obviously if the trouble is still present to a noticeable degree, even after cleaning, or sets in directly a thin coating of carbon has formed, the compression is much more excessive than we can run without knocking when there is a considerable deposit. In speaking of the commencement of knocking, it is well to impress that the expression in this case implies knocking when picking up on a normal mixture, and with the ignition at a normal degree of advancement the compression can then be lowered by fibre or aluminium plates of experimental thickness placed under the cylinder in the usual manner until one is able to drive with a sidecar on practically the same mixture strength as one uses solo, or, at least, inappreciably stronger. The necessity for sudden heavy "anti-konking" doses is not a legitimate one, and its elimination must be attended to if economical running is to be obtained.

We have dealt with one of the most prevalent causes of waste, but it must not be imagined that lowering the compression alone will always effect the desired result, as there are many $3\frac{1}{2}$ h.p. machines in which this procedure would merely destroy the power for the reason that their design demands a high ratio. It is but fair to add, however, that such mounts are for the most part two and three-year-old productions, and were not primarily intended for such a load.

In the next section of this article the mechanical factors in economy and those concerned with carburation will be discussed.

(To be concluded.)

130 m.p.g. on a 5 h.p. Indian.

I am wondering if any of your readers have had a similar experience to mine, and, if so, can they give any explanations, for then motor-cyclists might benefit by what they have to tell us?

In June I bought a new 5 h.p. twin Indian, standard throughout, and that is my only connection with the firm. It takes me a few weeks to run a machine well in and get it to my satisfaction, in tune, etc., but from the first I noticed that the mileage to the gallon of petrol seemed to be somewhat abnormal.

During the last month I have gone in for some careful and reliable tests, and find that when going at an average speed of, well, I will not say how many miles per hour, but certainly fast enough to satisfy any rider who values his own and other people's safety, I get from 130 to 140 miles to the gallon. The machine is by no means a light-weight, neither am I, being nearly 6 ft. 2 ins. in height and of fairly heavy build. I am not at all a highly skilled rider or tuner, but am fond of machinery, and always listen to the running of my engine, and pay prompt attention to any new sounds which may develop.

My last machine was a $3\frac{1}{2}$ h.p. single, certainly not capable of the speed of my present mount, within 10 m.p.h., yet I was then content if I got 80 miles to the gallon.

I have just returned from another test run of 96 miles to-day at a thoroughly good average speed, and find, on accurate measurement, that I have used three quarts less two ounces of petrol. What is that (at present) elusive something which makes all the difference in petrol consumption between two machines which appear to be precisely alike?

Wisbech.

PARSON No. CE1711.

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Yet another indication that the silent, supple machine is the most economical to ride. Do not forget that it holds in addition, the World's 500 miles record and the World's Endurance record.

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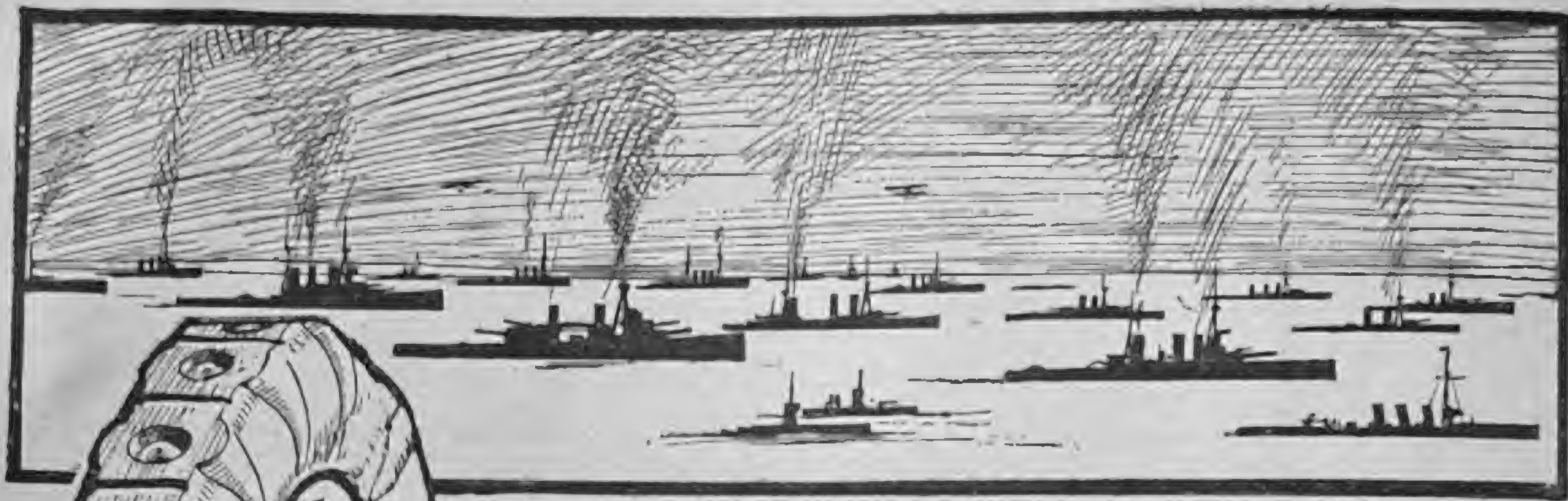
366-368, Euston Road, London, N.W.

Telephone—Museum 1643.

Telegrams—"Hendian, Eusroad, London."

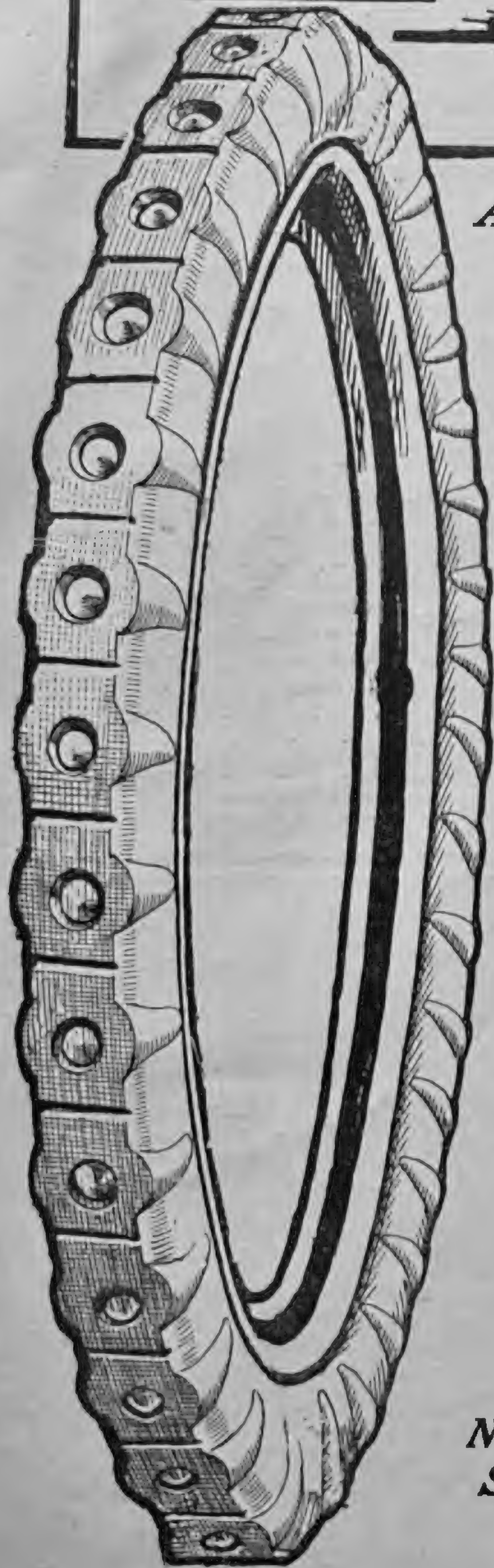
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MotorCycling

NEWS in BRIEF.

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LIGHTING —UP— TIMES.

Next
Saturday,
16th October.



LIGHTING-UP TIME in the Metropolitan Police Area is half an hour after sunset; elsewhere, one hour after sunset. Dublin mean time is given for that place. It is 25 mins. earlier than Greenwich.

The local mean time for Dublin, which is 25 mins. earlier than Greenwich, is given.

MOON.—Useful moonlight next week-end. First quarter rises 2.45 p.m., sets 11.36 p.m.

FOLLY AS IT FLIES.

It has been suggested that waistcoats worn back to front offer more protection.

Anyone starting another wrong-way-round discussion will need it, we should say.

"Aeroplane, 2 $\frac{1}{2}$, 2-stroke, specially tuned up, can do 4 to 40 miles, shop-soiled, £25 to clear."—From "The Liverpool Echo."

As 40 miles is its limit, they do not want it at the Front.

A correspondent in the "Yorkshire Post," urging a tax on pedal-cycles, says that when he is driving his two-wheeler he is taxed at 15s.

Lucky man, say we who have to pay £1.

According to "Freeman's Journal," of Dublin, a member of the motor trade has expressed an opinion that the motor tax would cause a falling off in the purchase of motorcars and motorcycles, but that it would not seriously interfere with the trade.

Of course there is always the extensive and lucrative business of taking in each other's washing open to enterprising traders.

Spring Frames, Please.

Many of our main roads are becoming more pot-hole every week. Hurry up with those spring frames for 1916, Messrs. Manufacturers.

The Best Headgear To-day.

A despatch rider writes:—"What is the trouble about the wrong-way-round cap craze? If a man cannot keep the ordinary headgear on, let him try a khaki cap. One can be obtained free of cost on application at the recruiting office."

Motorcyclist Receives Damages.

A sum of £15 damages and costs was awarded at the Birmingham County Court last week to a motorcyclist as the result of a collision with a pony and trap, which was said to have knocked the pony off its feet and overturned the trap. It almost takes one's breath away; but then we should expect the home of the industry to set an example in this respect.

Journalistic Appointments.

Owing to enlistments, there are vacancies on the editorial staffs of MOTOR CYCLING and other journals published by Temple Press Ltd. Necessary qualifications are technical or general engineering knowledge and training, considerable experience of motoring, and ability to handle any motoring subject in a practical, fluent and interesting manner. Applications should be by letter, and they will be regarded as confidential and dealt with personally by Mr. Edmund Dangerfield, managing director of Temple Press Ltd.

A Conflict of Evidence.

It is extraordinary what a conflict of evidence there is in motorcycle cases. At an inquest on an old man of 75, who was knocked down by a motorcyclist, various witnesses stated that (1) the motorcyclist was proceeding at a moderate speed (14 m.p.h.); (2) that the driver was not to blame; (3) that the old man stepped backwards and forwards; and (4) that the motorcyclist slowed down before the accident, so that witness (a cyclist) was overtaking him. The police view, however, was that the motorcyclist deliberately ran into the old man, but the jury brought in an open verdict, and not one of manslaughter, evidently in view of the weight of independent evidence.

1916 MODELS.

As the recognized medium for giving first particulars of new models, our readers will look naturally to us to produce a complete and comprehensive review, as we did last year. Two Special Numbers, announced previously, are now in preparation. They will deal with all the new motorcycles, new models and new accessories, and will form a useful buyer's guide for 1916. These numbers will be issued about the end of November.

Motorcycle Frame Sets Wanted.

If any manufacturers are able to supply complete motorcycle frame sets we can put them in touch with a Midland concern producing a new motorcycle.

The Standard of Speed.

A defendant who was fined £2 in a dangerous driving case at Eastbourne stated, as proof positive he was not driving at a fast speed, that he had his wife and baby in the sidecar. Estimates of speed henceforth, we presume, will be based on the passenger, and woe betide the man who has a nice little flapper on the carrier!

Advice to Pedestrians at Night.

At an inquest on the death of a soldier, who was knocked down by a military motorcyclist one night at Beccles, the coroner made some strong comments on the desirability, now that no vehicle is allowed to use powerful lights, for pedestrians to keep strictly to the footpaths



Sidecar machines (as well as 400 cars) assisted in conveying 210 wounded soldiers to a matinee at the Leicester Palace Theatre.

"Penny Wise," Etc.

The "Poor Law Officers' Journal" has some pointed remarks to make with regard to the parsimony of the Sevenoaks Guardians in refusing a small allowance for the upkeep of a motorcycle which one of their relieving officers, whose round had recently been extended, deemed necessary in order to carry out his duties. The amount asked for was only £20.

The Usual Jury!

While both were travelling at a moderate speed a motorcycle and sidecar came into sudden collision with a tramcar at Sunderland, the motorcyclist being killed. At the inquest the explanation was given by the tram driver that the motorcycle suddenly swerved into the tramcar, which he thought was through the wheels catching in the tramlines. Notwithstanding this most feasible explanation, the jury added a rider to their verdict that a warning ought to be given to cyclists (sic) and others not to travel fast in the darkened streets.

News in Brief (contd.).

Military Motorcyclists Wanted.

Ten military motorcyclists per month are now required for the West Lanes. Divisional area. Applications from skilled motorcyclists should be addressed to Mr. S. W. Philpot, secretary, Motor Cyclists Reserve Committee, 60, Lime Street, Liverpool.

Might Have Been Expensive.

An awful thing might have happened the other day. A motorcyclist lent a machine to a friend, and, in defiance of the law, put his own registration number on it. Next day they met and, naturally, stopped for a chat and, incidentally, for some refreshment. Presently another motorcyclist approached them and said: "You may think it economical to make one number do for two machines, but it's expensive when you leave the jiggers side by side." They melted away at speed, after that, in a manner that would have made a zealous policeman weep.

Awkward—Very.

The following yarn reaches us:—A motorcyclist whose machine had a deflated tyre stopped at a country inn to see if he could borrow a pump, as he had lost his own. In the yard he saw a motorcycle, the owner of which was not in sight. Considering that his necessity justified the liberty, he borrowed the absent man's pump, and absent-mindedly fixed it to his machine as he was about to ride off. At this moment the owner appeared, and the most laborious and ingenious explanation did not seem to satisfy him. A few miles further on the pumpless one stopped at a garage, and, seeing a job line of very cheap inflators, bought three, as he said he was always losing them. Towards the end of the day he met the man from whom he had borrowed without permission, and this sarcastic person, after regarding the bundle of pumps, remarked: "You seem to have made a good haul to-day!" We fancy we have heard another version of this yarn.

A Question of Identity.

It must be a difficult thing to identify a motorcyclist who has failed to stop when called upon to do so, if the incident occurs at night. An interesting story of the pursuit of a motorcyclist who did not stop when called upon was related at the Battle petty sessions last week. According to the police a motorcyclist was asked to stop, because of the bright light he carried, but went on. The policeman chased his quarry on a bicycle—some policeman!—and ran him to earth at a point where he had taken a wrong turning, but again this mysterious driver, turning the sidecar upon the policeman, got away; but a motorcyclist who appeared in the vicinity of this incident some time later was challenged, and he also, it was alleged, refused to stop. Once more the chase proceeded—it was said of the same motorcyclist throughout—and at last the policeman was successful, the excuse for not stopping, it was stated, being that the motorcyclist's "gear got caught" and he could not pull up, whatever that may mean. The motorcyclist (who was caught, however) brought irrefutable evidence of mistaken identity, and the case was dismissed.

B8

KEEN COMPETITION FOR PLUGS.

Another Opportunity for Obtaining One of the "Motor Cycling" Sphinx Sparking Plugs.

MUCH interest has been aroused by our offer of MOTOR CYCLING Sphinx plugs for the best suggestions for improving 1916 models. This competition is now closed, and the selected letters, for the best of which we shall present plugs to the senders, will appear in our next issue.

Several lines in our description of this plug last week got what is technically known as "pied." Hence readers were probably surprised to hear that this plug "does not readily ignite!" Again, that "each plug will bear a facsimile of MOTOR CYCLING on the electrode." It should have been pointed out that as the result of tests we have found that the

plug has no tendency to pre-ignite, nor will it readily oil up. The names MOTOR CYCLING and "Sphinx" appear on the statite insulation.

Plugs for Hints on Petrol Saving.

The next competition will be for the best hints on obtaining petrol economy. For this we offer four plugs, for what we consider to be the best four hints on petrol-saving ideas effected by readers. Competition papers should be limited to about 250 words. Envelopes should be marked "Sphinx" in the top right-hand corner, and addressed to the Editor, MOTOR CYCLING, 7-15, Rosebery Avenue, London, E.C.



The auxiliary motor attachment on the road, described on page 568.

"Rudge" Rowlandson, O.C.

We hear that Mr. "Rudge" Rowlandson is now Officer Commanding Motorcycles at S.H.Q. They have chosen the right man.

The Release of British Manufacturers.

In our issue of the 7th September we dealt with the possible release of British motorcycle manufacturers to the extent of 25 per cent. of their output, and referred to the fact that certain commercial motor manufacturers had already been released. We are now informed by the Minister of Munitions that, while certain lorry manufacturers are being permitted to supply vehicles above a certain minimum required from them by the War Office, they are only allowed to do so to firms who can give evidence that they are actually employed on work in connection with War Department contracts, and that such lorries are not allowed to be sold indiscriminately to private users.

Misuse of the Word "Cycle."

The Editor of "Cycling" writes to the newspaper world, pointing out that many newspapers make the mistake of referring to a bicycle as a pedal-cycle or, worse, push-bike.

"Pedal-cycle" is inaccurate," he points out, "because many motorcycles have pedals; and 'push-cycle' and 'push-bike' are merely slang terms. The word 'bicycle' is quite sufficient."

The Result of Intelligence.

Though the lightweight of but six years ago could not compare with a modern mount," says a contemporary, "it was plain to those who made an intelligent study of the question that in the lightweight we had the motorcycle of the future."

Yet we think it was once said that anything smaller than 3½ h.p. was unsuitable for motorcycle work, but nevertheless for this general recognition of our intelligence, as pioneers of the lightweight motorcycle, many thanks.

NOVELTIES IN AMERICAN DESIGN.

Fine Display at the Chicago Show—United States Manufacturers Turn Their Attention to Two-strokes—A Pedal-cycle Attachment—Alterations and Refinements in the Famous Big Twins

ON the 20th of last month the Chicago Show opened with a fine array of new models of well-known machines and some newcomers into the motor-cycling world. Owing to the remarkable boom of trade in the States, it is probable that between 40 and 50 per cent. of those who visited the Show went there to buy machines.

Excelsior New Models.

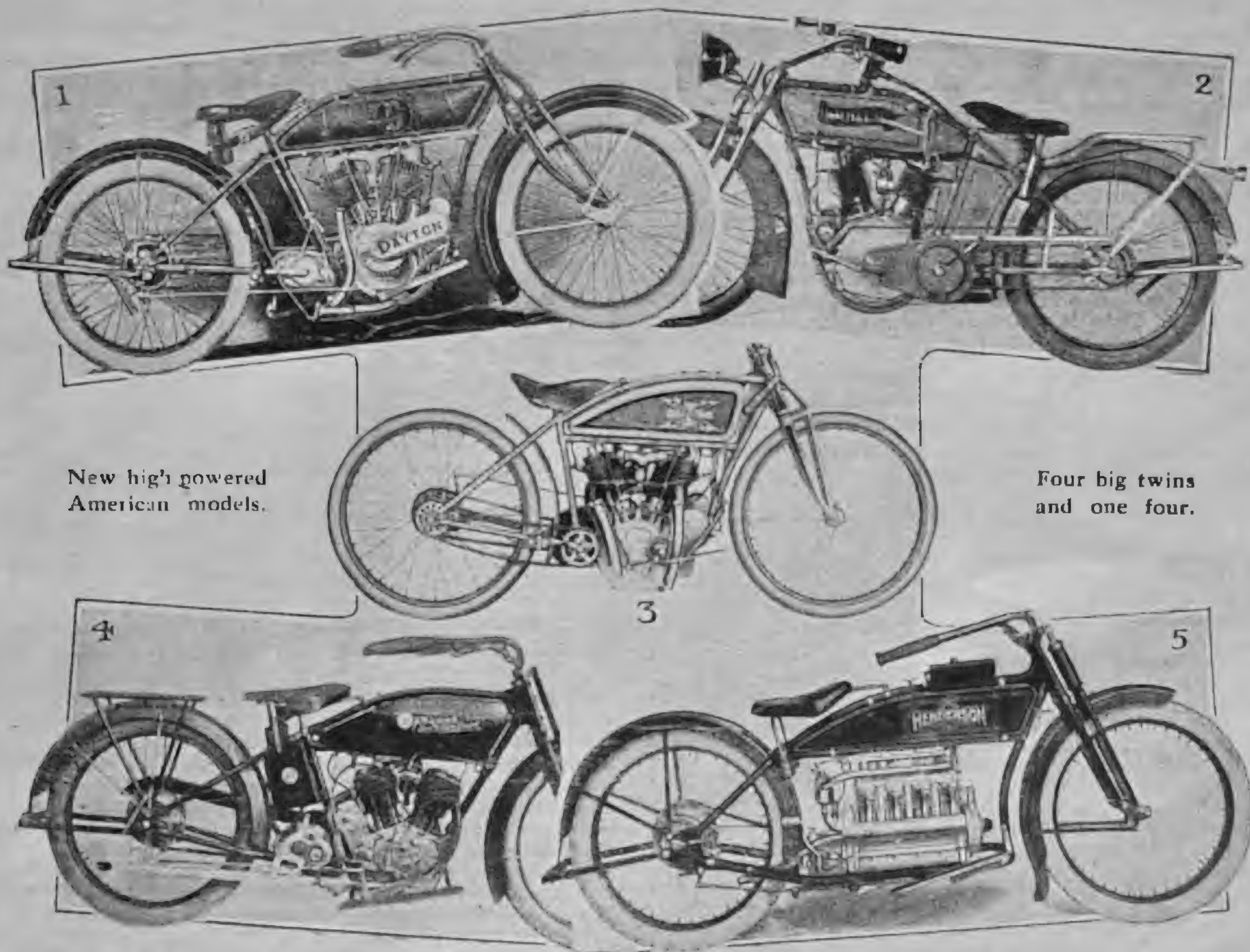
The Excelsior Motor Manufacturing and Supply Co., of Chicago, found their 1915 three-speed models so successful that they are only making very slight alterations in these for 1916. The engine has a capacity which just brings it within the 1000 c.c. limit. A slight alteration in the tank has been made, so that it is possible to prime the motor by leads direct to the inlet valve domes. All that it is necessary to do is to open a needle valve.

A machine, which is called the Police Model, has been specially made for the benefit of the motor constabulary, who are required to regulate the traffic. Their duties call for slow running and rapid acceleration and high speeds. The engine of the Police Model Excelsior is practically the same as that of

the racing type, but the machine has been fitted with a three-speed gear.

The racing model has a very short wheelbase, and the front fork is of the rigid type. The power is transmitted to the back wheel through a multiple-disc clutch to a countershaft. There is no mudguard to the front wheel, and only a short one to the back.

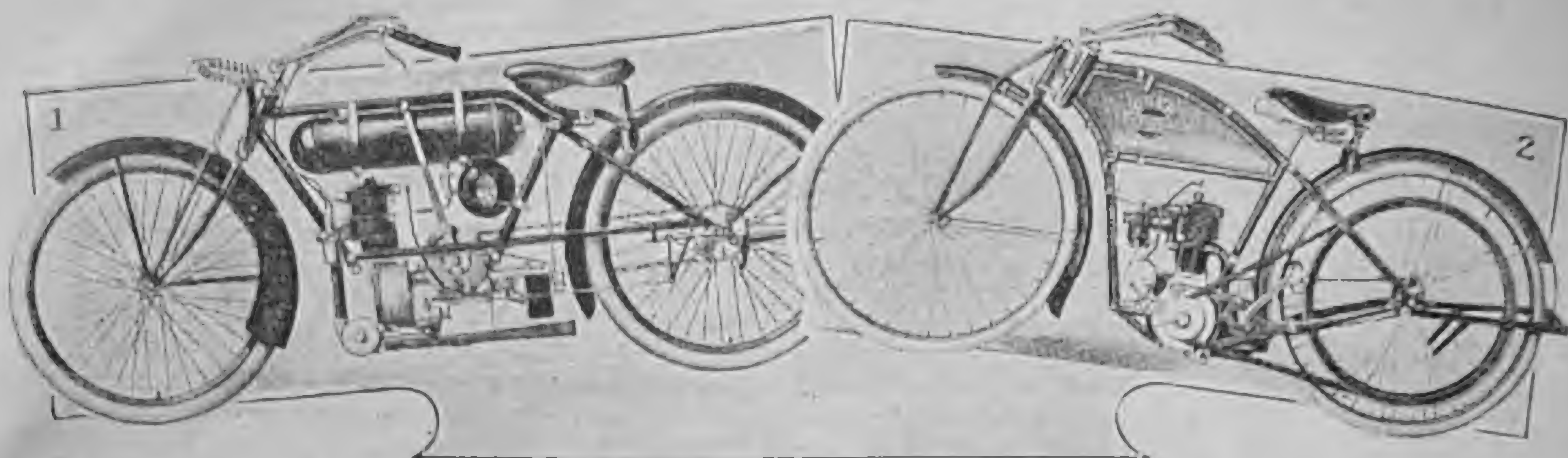
As we announced last week, the Excelsior concern has brought out a lightweight. An American paper, remarking on this, says: "It is distinctly foreign in appearance, but is thoroughly Americanized in simplicity of control and interchangeability of parts." The engine, of which we give illustrations, it will be seen, follows closely the lines of a well-known English one. It is fitted with an outside flywheel with heavy rim, and a compression release valve is placed in the top of the cylinder. The main shaft runs on a ball bearing on one side, and a long bronze bush on the other. Both bearings are fitted with glands to prevent the escape of gas while it is being compressed in the crankcase. The two-speed gear is of the ordinary sliding type, power being taken from the engine by a chain and transferred to the road wheel by a "V" belt.



New high powered American models.

Four big twins and one four.

at the Chicago Show. (1) Three-speed high-powered twin Dayton. (2) Emblem electrically. (3) The Excelsior racing model. (4) The Reading Standard. (5) The Henderson new model, showing the kick-starter.



Two interesting two-strokes at the Chicago Show. (1) The Cleveland, with engine set across the frame and a worm-driven countershaft. (2) The Tiger Auto-bike, which has a two-stroke engine with an auxiliary valve.

Henderson Models at the Chicago Show.

The Henderson models for next year have but few alterations. There will be two as before—one the clutch model and the two-speeder. One of the alterations is the conversion from a pull-up hand starter to a kick starter. This alteration is quite simple to make on existing models. Another equally simple improvement is the adaptation to dual clutch control, which can also be fitted to existing models at a very small cost. This dual control means that either foot or hand can be used independently. Another little improvement is the addition of a clutch and chain guard to prevent the lubricant flying up from the rear chain on to the rider's trousers. An alteration in the engine has been made to bring it under the 1000 c.c. limit, and probably this model will be seen in competitions next year. Owing to the drop in the price of Hendersons, Messrs. Robertsons, of Great Portland Street, London, W., the English concessionaires, state that in spite of the Budget there will be no increase on the present prices so far as they can see.

Combined Clutch and Brake Control on Pops.

The Pope machines for 1916 are now being made by the Westfield Manufacturing Co., which took over the Pope Manufacturing Co. in toto a few weeks ago. An interesting alteration is provided in the form of combined clutch and brake control, after the pattern that was fitted to some of the earlier English light cars. On the clutch pedal being pushed half out the clutch is released, and on further depressing the pedal the brake is actuated. The machines for next year

will be fitted with a three-speed gearbox and foot starter. The change-speed mechanism of the gearbox is interlocked with the clutch, so that it is impossible to change gear without first disengaging the clutch. The Pope machine has an engine of just under the 1000 c.c. limit.

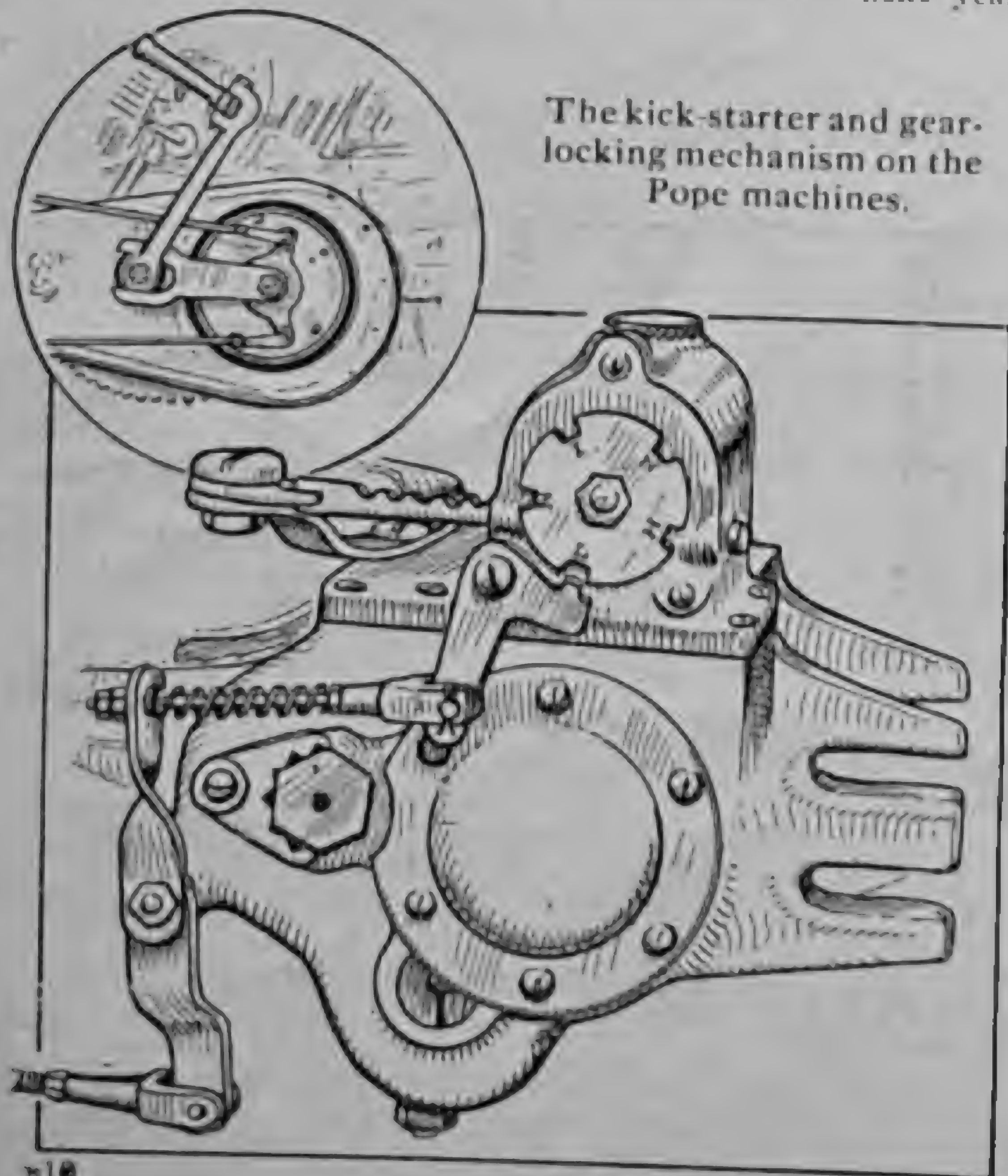
Reading Standard Co. Specialize on One Model.

The Reading Standard Co. are only placing one model on the market for 1916. This is a heavy twin, fitted with three-speed gearbox, clutch, mechanical oiler and kick starter. The three speed gear is of the countershaft type, and is very accessible. It can be removed from the frame without disturbing the engine.

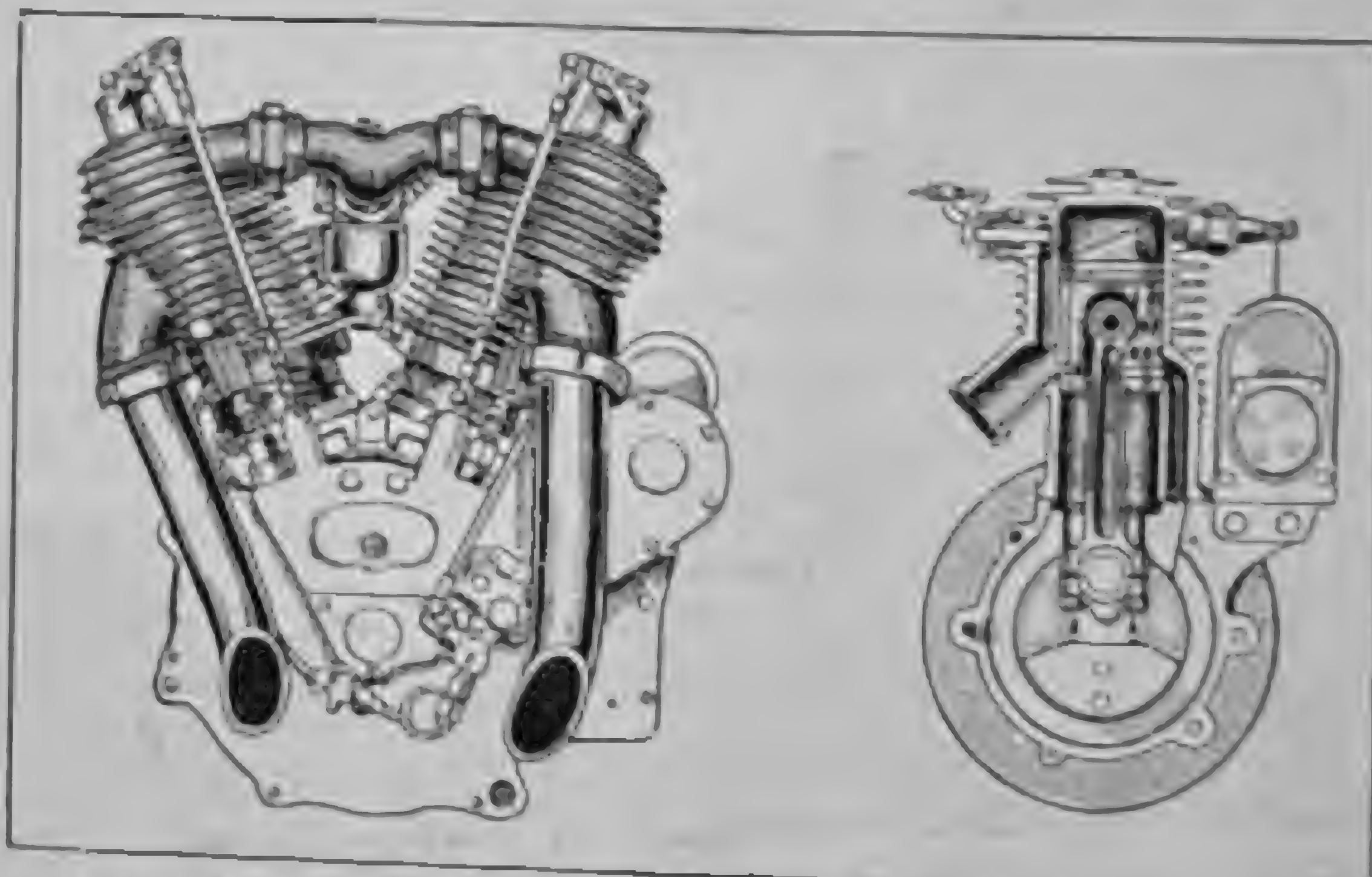
A New Emblem Lightweight.

Emblem motorcycles are being made this year in four distinct models—two heavy twins, a single-cylinder, and a light twin. The first model, which is stated to develop 14 h.p. under ordinary conditions, has proved very popular in the States during the present year, and is consequently being continued for 1916. The next model, which is not quite so big, is claimed to be able to do 65 m.p.h. on the road.

The small twin model is an enormous surprise for every-



The kick-starter and gear-locking mechanism on the Pope machines.



(Left) The engine of the big Excelsior racer. (Right) The power unit of the small Excelsior two-stroke.

body connected with the Show, with the exception, of course, of the manufacturers themselves. The American twin, as a rule, is an exceedingly heavy and powerful machine, as is evidenced by the two large models which we have referred to above. Although this twin is such a great innovation on the American market, the price has been kept very low (£30), and yet there is practically no detail that has been overlooked, with the exception of a speed gear, which, however, can be supplied for an extra £5. The bore and stroke of the engine are 64 mm. by 76 mm., which give a cubic capacity of 488 c.c. Mechanical inlet valves are situated directly over the exhaust valves, and the valve mechanism is practically the same as that used on the larger motors. Lubrication, however, is by sight drip feed, and is supplemented by a hand pump.

The front forks are decidedly interesting also, as the fork prongs themselves are made of flexible steel.



Round at your Dealers



you will find various patterns of Clinchers. They vary in weight and design,—so that they will suit every purpose and every machine,—but they do not vary in quality. One quality they are, and that is the best.

Examine them; ask your friends who use them; go right into the matter; make every inquiry and every test that Clinchers' claims are just—pick out the one that suits you best, fit it and—ride it.

Give it hard work to do, you will not find it wanting in quality, resiliency, grip or durability.

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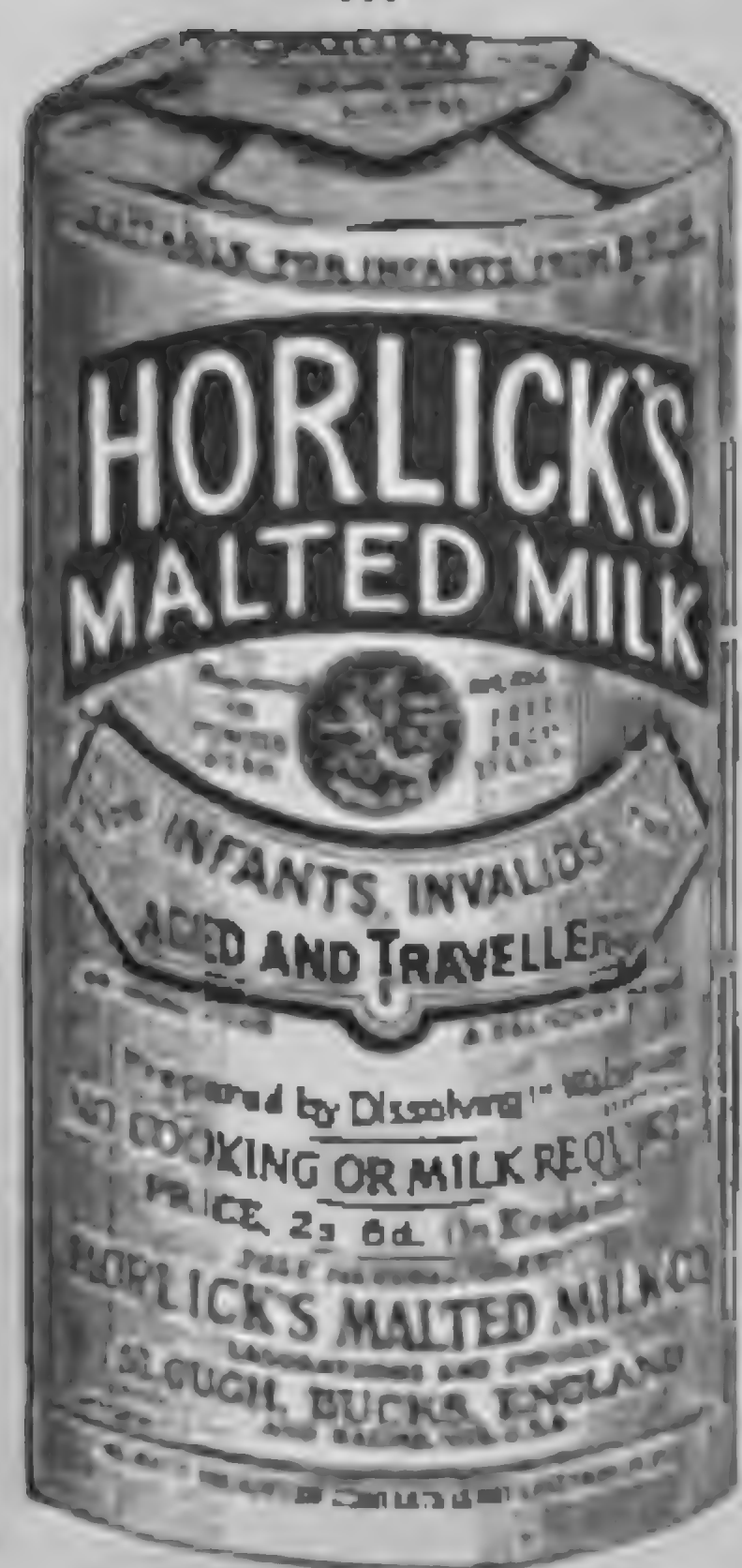
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A glass of Horlick's is always the best invigorator. Taken before a ride it will give strength and endurance, and after strenuous exertion there is no better pick-me-up. At all times it gives and maintains fitness and stamina, and is especially useful to men on Active Service.

Superior to tea, coffee, cocoa and beef extracts.

READY IN A MOMENT WITH HOT OR COLD WATER ONLY. NO COOKING. SERVED IN HOTELS, CAFÉS, AND RAILWAY REFRESHMENT ROOMS.

Also available in the form of delicious Food Tablets to be dissolved in the mouth: Relieves Hunger and Thirst, and prevents Fatigue.

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Tubes. The ones I have now, have been in since June, 1913, and seem as good as ever.

Enclosed please find Postal Order in payment of
Yours truly, _____"

The above absolutely unsolicited testimonial can be seen with a thousand others at our offices, also hundreds of butt ends of all makes, British and Foreign, which have been replaced with our joint.

Start well and save money by having our tubes fitted in the first place, don't be put off with other makes, and then have them converted. Our tubes are made all in one piece, and no butt ends to burst.

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The Thames Rubber & Leather Co., 199, Upper Thames St., LONDON E.C.

Novelties in American Design (contd.).

Dayton Lightweight with Front-wheel Drive.

Six models of the Dayton twin motorcycle are announced for 1916, three having the Dayton motor of 8 h.p., and three the Spacke de luxe motor of 9 h.p. Four models have two-speed gearboxes, and it is on these that the principal improvements over last year's Dayton machines have been made. There are two electrically-fitted models and two single-gear models, but only twin-cylinder machines are manufactured.

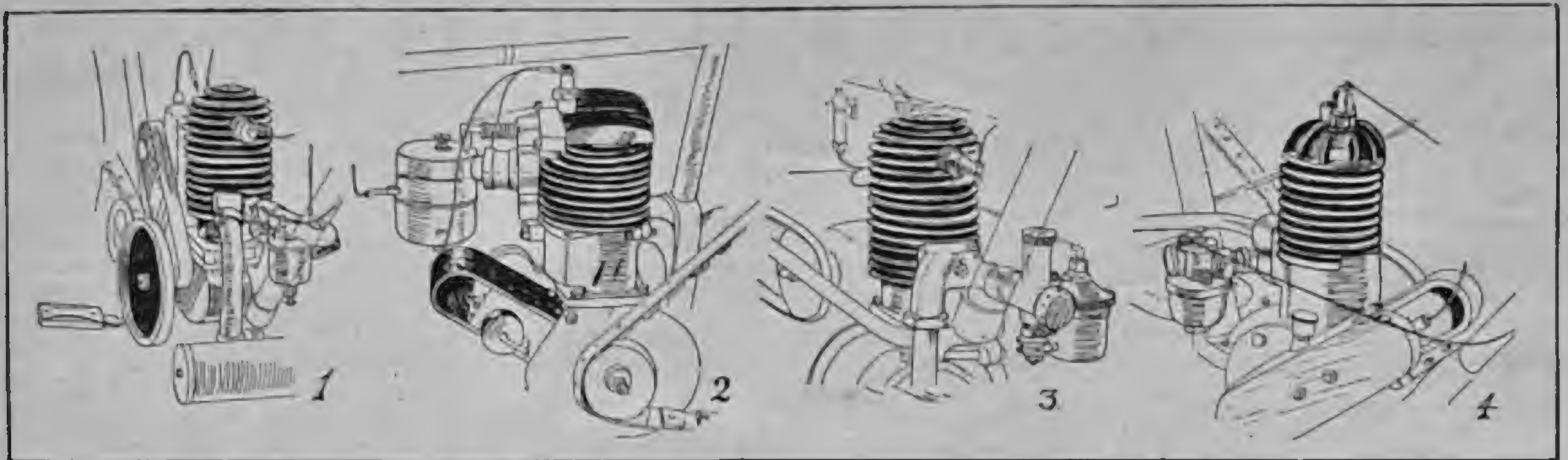
In addition to the six new models of the Dayton motorcycle which made their appearance at the Chicago Show the

The Cleveland Light Motorcycle.

For 1916 this make of motorcycle has practically no changes since its first appearance on the market last summer, the only one of any importance being a rocking pedal control to the two-speed gear. It is interesting to note that the drive on this two-stroke consists of Coventry roller chain. This machine was described in a recent issue of this journal.

A Pedal-cycle Attachment.

The Cyclemotor is an attachment for fitting to an ordinary bicycle. This is the first appearance of this attachment at a motorcycle show, as the manufacture of it has only just been commenced in the States. The Canadian Co. have, how-



Four types of American two-stroke engines. (1) The Excelsior. (2) Tiger. (3) Cleveland. (4) Schickel.

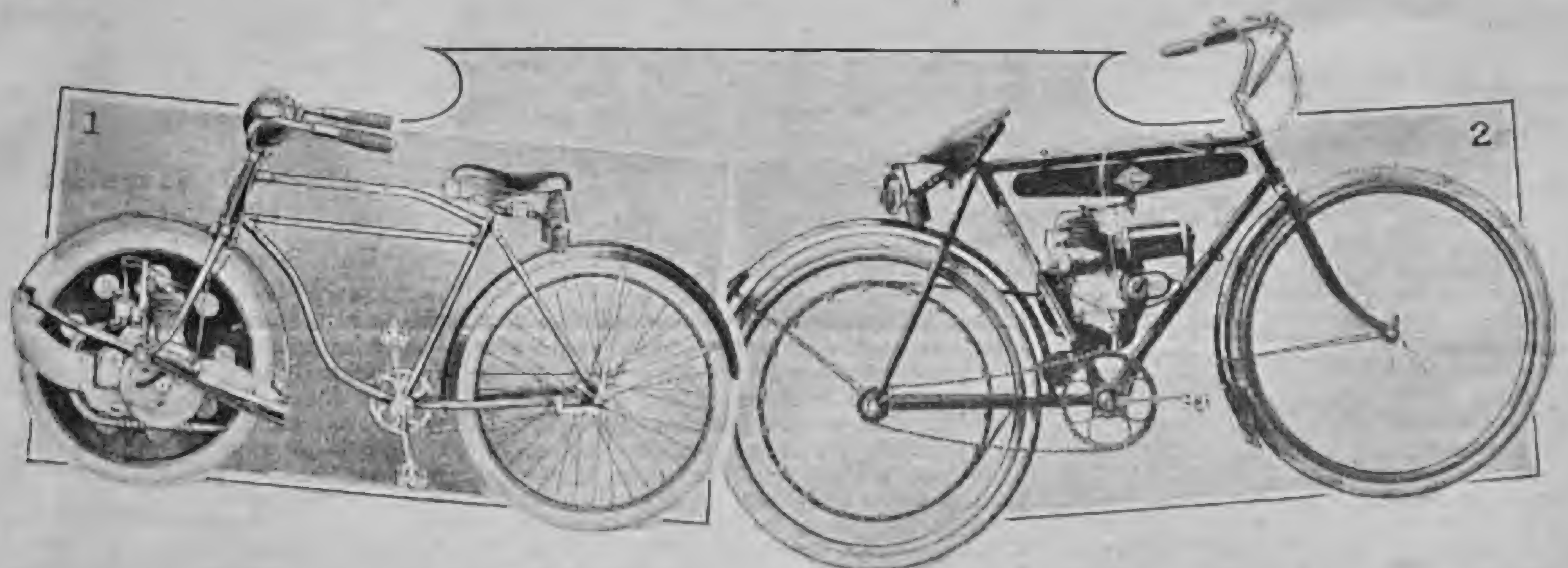
manufacturers have since put on the market a remarkable lightweight machine. The whole of the driving mechanism of this lightweight is situated in the front wheel, which is of the pierced disc type. The engine, which is situated near the centre of the wheel, is a single-cylinder four-stroke motor, with an automatic inlet valve over the exhaust valve. The bore and stroke are 60 mm. by 56 mm. and the motor develops 1½ h.p. at normal speeds. The method of carrying the power plant is very ingenious. Bearer arms of aluminium are bolted to the front and rear ends of the crankcase, and these arms taper and have eyes at their ends to attach to the curved ends of the multi-leaf Dayton spring fork, as is used on the big twins, but constructed to suit the smaller weight of the machine. To the extremities of the bearer arms and the ends of the springs are attached tubular members, one each side of the plant, and at the centre of these tubes the front forks are attached. The motor, of course, drives the disc wheel through a reducing gear. This disc wheel is fitted with a 24 in. by 2 in. tyre. The petrol tank is attached to the handlebars of the machine. The price at which this model is announced is \$95 (approximately £19).

ever, made the outfit for the last year, but their exertions have been confined to Canada only. The attachment was described in our issue of 21st September.

A Two-stroke With Auxiliary Valve.

The "Autobike" Co., of Chicago, has brought out a two-stroke with a very interesting engine. This has an auxiliary passage, the lower end of which communicates with a space formed by a slot in the piston and also above the piston head when the piston is at the foot of its stroke. The carburettor is connected with this passage by a short pipe carrying a spring-regulated poppet valve. At the upper end of this passage is another poppet valve giving direct communication into the cylinder close to the top. The result of this construction is said to be that a direct flow of cool gas goes into the cylinder at the top, and it is stated that back-fire is prevented and a cleansing action takes place as the gases pass into the top of the cylinder. The bore and stroke of this engine are 63 mm. by 70 mm., which give a cubic capacity of 218 c.c.

The price of this machine is interesting, in that it has been brought down as low as \$1 per pound, the machine weighing 112½ lb. and the price being \$112.50 (about £23).



Two very close cousins of the bicycle. (1) The Dayton lightweight, and (2) the Cyclemotor.

Novelties in American Design (contd.).

The Smith Motor Wheel.

The Smith Motor Wheel, which is the American edition of the well-known Auto-Wheel, has but very slight changes which can be noticed for 1916. About the most important is the fitting of a mechanical oiler which is of the cam-operated plunger type. The cam is worm-driven off the valve camshaft, and the pump forces oil into the tray into which the big end of the connecting rod dips. The level of the oil in the tray is maintained. The oil is pumped from the sump into the trough and returns through a passage at the correct level to the sump to be used over again.

The Motor Wheel seems to have occasionally got out of control through the Bowden wire control breaking, and another little improvement is that, should this happen, a spring instantly closes the induction pipe, cutting off the mixture and so bringing the engine to a stop.

Miami Flying Merkels.

Eight models in all are offered for 1916 by the Miami Cycle and Manufacturing Co.—three Miami models and five Flying Merkels. The Miami, of course, is a single-cylinder lightweight, and the three models consist of a chain-driven one with two-speed gear, a belt-driven single speed, and a belt-driven single speed model with battery ignition instead of magneto. The two-speed Miami has its gear lever situated in a quadrant just below the peak of the saddle, so that it does not foul the knees of the rider. The gears on this model have a ratio of 6.3 to 1 and 11.5 to 1. The Flying Merkels are practically the same as last year, with the exception of one twin which is provided with overhead valves and big lift cams for speed work. The model which was on show was not in its finished state, but it is stated that this engine will be fitted in the racing frame, in which case it should prove to have a greatly-increased speed as a result of this change in the valve mechanism.

New Bosch Mag-Dynamo and Other American Novelties.

Lighting and Ignition in One.

An interesting feature amongst the accessories at the Chicago Show was the new model Bosch mag-dynamo. The system is unique in many ways. It embodies two separate and distinct systems, each one a complete unit in itself, i.e., there is a complete Bosch high-tension magneto and a complete dynamo as well. They can be used independently, and if one breaks down it has no effect on the other.

A very interesting fact is that the Bosch combined system is interchangeable with the standard Bosch magneto, so that any motorcycle at present fitted with a Bosch magneto can with little or no trouble be fitted with this new instrument. The winding of the lighting generator is novel. It has the ordinary shunt wound generator, which is simply charging the battery during the day, but the lighting circuit is con-

It should be noted that this is the product of the American Bosch Magneto Co., and so far as we know is not on sale yet in this country.

The Midget Magneto.

A new magneto has been manufactured by the National Coil Co., Lansing, Mich., U.S.A. This magneto, which is known as the Midget, weighs only 3 lb. 10 oz., and therefore it is claimed

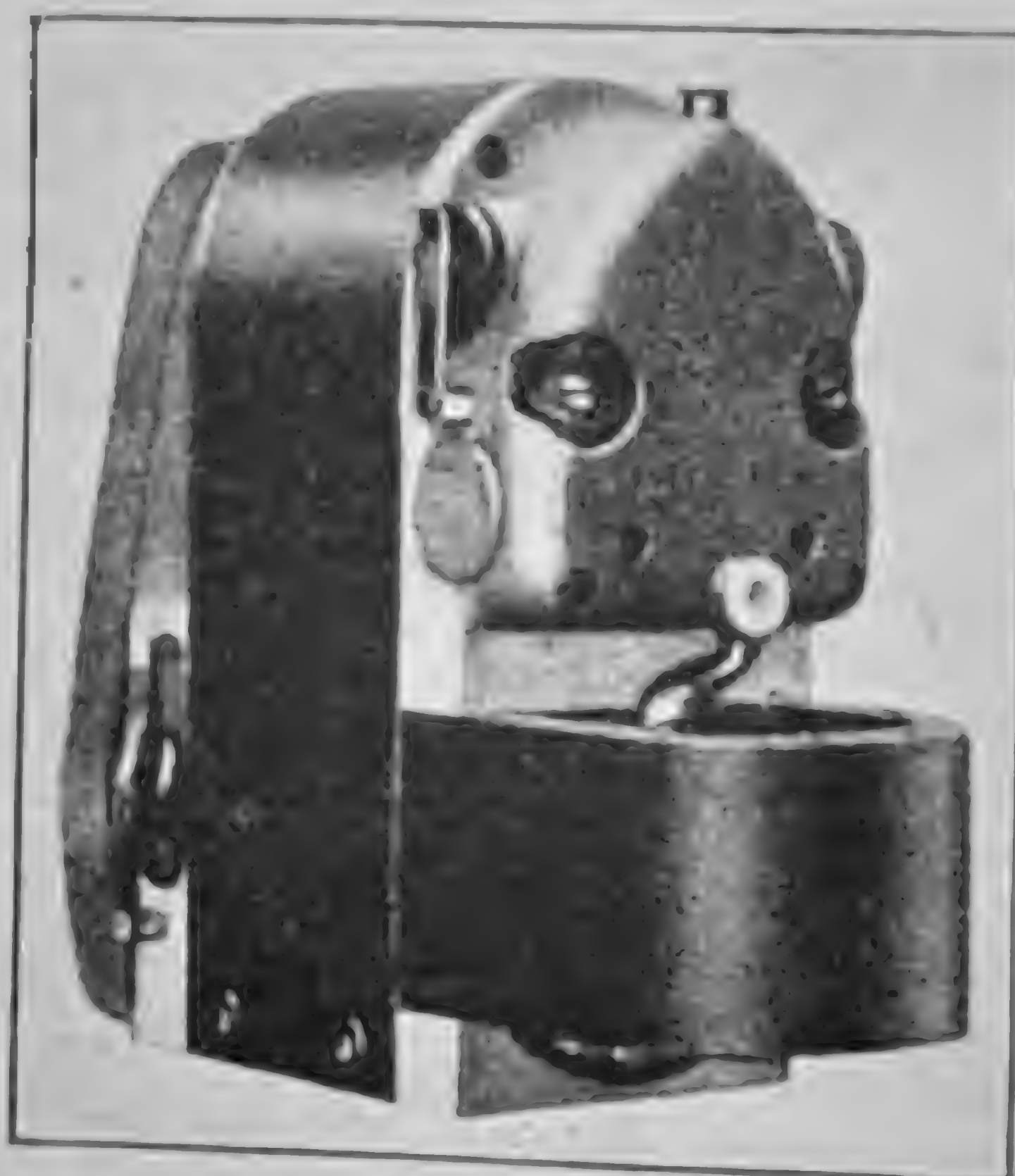
Steamtight threads are cut ensuring a waterproof connection. The condenser is made from thin tin-foil and close-grained tissue paper with mica insulators, and is assembled to the armature end-plate.

The Bobra Sparking Plug.

Among other interesting accessories at the Chicago Show was a sparking plug which is unique in its construction. The electrodes are attached to the porcelain, which is easily removable from the main shell by raising a wire clip which clamps the porcelain into the shell, and in this way, when the porcelain is removed, the entire mechanism of the sparking plug comes out with it and all that remains in the cylinder is the shell, which, when once screwed in, never need be removed, even to insert a new plug, since the porcelain carries the only part which is likely to need renewal, and new porcelains are always interchangeable.



The Midget magneto, weighing under 6 lb.



The new American Bosch mag-dynamo.

to be the smallest high-tension magneto at present on the market. It is made in two models, one for mounting directly on to the crankcase of the motor and the other on the regular square base for standard fitting. The armature is of the ordinary type and the laminations are fitted through stiff sheet steel. The primary insulators are made from varnished silk; the secondary wiring is made with varnished paper insulation. All armatures are tested with an exceedingly high voltage, and those that do not stand the test are discarded. The contact breaker, which is shown in our illustration, provides a very positive action at all speeds. Provision is made for a handlebar switch, and the entire magneto is water and dust proof. A compressed hard rubber plug is used to hold the high-tension brush; this plug screws into the high-tension bracket, which is held rigid and prevents vibration.

needed through a series field so that immediately the lights are turned on the field strength is increased in proportion to the amount of current being used and the output of the dynamo is increased accordingly.

As regards the wiring of this dynamo, nothing could be simpler. There is one wire from the generator to the battery, and another from the battery to the distributing switch, from which the usual wires run to the lamps in circuit, the return being through the instrument.

The normal capacity of the generator is 4 amps., 7½ volts, or 30 watts., and the weight is 19 lb.



The Bobra detachable sparking plug.

Hub Gear Repairs.

The readers of this journal who are at present finding a difficulty in obtaining repairs to their three-speed hub gears should note that Messrs. Percival Bros. and Webb, Ltd., 72, Moor Street, Birmingham, are making a speciality of this work, and have acquired all available stocks of replacement parts. They have also obtained the services of some of the mechanics who had been employed by one of the hub-gear companies, and are therefore in a position to deal with any quantity of work of this nature.



STOP WASTING OIL.

How many miles do you get from each gallon of lubricating oil?
You should know.

The function of a lubricating oil is to protect friction surfaces. To protect, it must wear well.

Why do some oils "wear out" so quickly?

Often their inferior quality will not withstand the heat of service.

Often the body of the oil is unsuitable for the engine's mechanical conditions. Excess oil then gets past the piston rings. Reaching the combustion chambers, it burns.

When oil is rapidly consumed, power waste also occurs. The fuel charge escapes past the piston rings on the compression stroke. Petrol consumption mounts up.

MAKE THIS TEST.

Begin now to count the miles of "wear" you get from a gallon of your present oil.

When you have used it up, clean out and fill the crank case to the proper level with the grade of Gargoyle Mobiloils specified for your motor. Again count the miles.

It is not uncommon for the first-time user of Gargoyle Mobiloils to worry because fresh oil is needed so seldom.

He frequently finds that a gallon of Gargoyle Mobiloil lasts twice as long as the oil he has previously used.

This superior "wear" is clear proof of the ability of Gargoyle Mobiloils to protect the moving parts.

It is far from being an accident. It results from correct quality and correct body.

With the correct oil, and piston rings and cylinders in good order, full compression results. And full compression is the only basis of full power.

The monthly cost-difference in petrol and oil is often startling to new users of Gargoyle Mobiloils.

Gargoyle Mobiloils are sold by dealers everywhere.



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DO NOT EXPERIMENT.

Do not experiment with lubrication but write to us to-day and we will advise you which grade of Gargoyle Mobiloils will suit your motor. You will then have oil that wears long because it protects well.

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Because you run a Lightweight machine, do not be misled into fitting Tyres that are inadequate for the work, but use

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M.C. 300

THE TWO-STROKE ENGINE

By Dr. A. M. LOW, A.C.G.I., D.Sc.

Owing to the author being engaged on work for the Government, the publication of this book has been unavoidably delayed; but it is now in the printer's hands and will be published shortly. Orders can now be booked, and will be dispatched in rotation on publication.

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NOVEL AUXILIARY POWER UNIT.

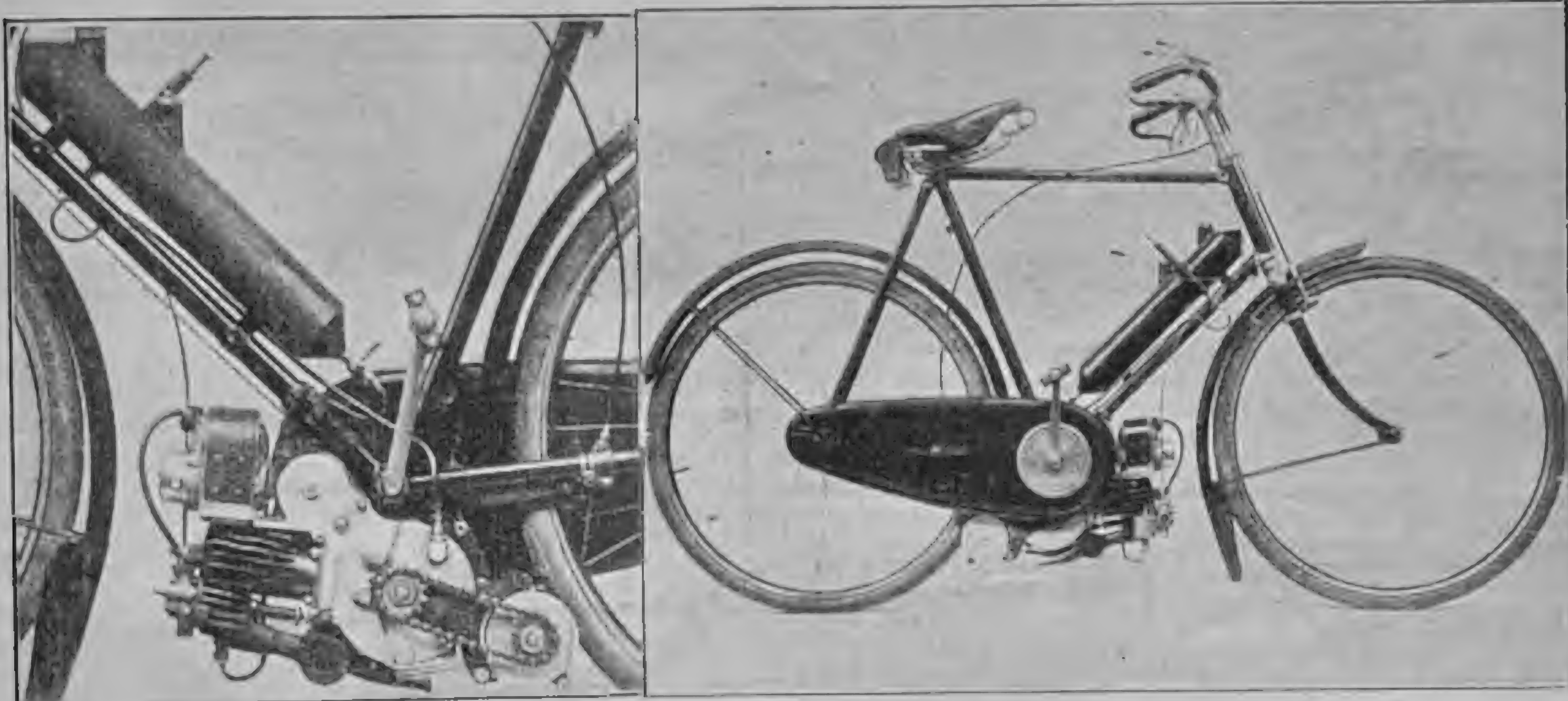
The Orbit Motor Attachment, which Drives the Back Wheel by a Friction Roller.

FROM time to time we have described and illustrated in the pages of MOTOR CYCLING and "Cycling" various new devices for applying auxiliary motor power to bicycles. A particularly interesting attachment of this description has just been completed, and will be known as the Orbit. The patentee is Mr. S. Dorset, lately of the Diamond Motor Cycles, and formerly designer of the little lightweight motorcycle called the Omega, made in Wolverhampton some years ago. His latest motor design is being handled by the Orbit Motors, Ltd., of Sedgley Street, Wolverhampton, and looks like proving a highly successful proposition. The little power unit is wonderfully compact, as will be seen from our photos. The engine is a small four-stroke one of $2\frac{1}{8}$ in. bore by $2\frac{1}{2}$ in. stroke and is of about $1\frac{1}{2}$ h.p. The inlet valve is placed overhead and is of the automatic type. The exhaust, however, is operated through the conventional cam and tappet, the timing wheels, rocker, etc., all being enclosed in the crankcase. From the half-time pinion a further set of gear wheels is

not be adopted finally, although a model with frictional drive like that illustrated is contemplated in addition to the proposed new system. This will be that of a sprocket engaging the cycle chain. The present transmission is from the engine shaft by chain to a sprocket, which is attached to a concave cast-iron roller, which can be pulled up against the tyre by means of a Bowden cable. This system, although found satisfactory, is open to objections.

The Chain-drive Type.

From the working drawings of the new attachment, which we have seen, a very ingenious form of drive has been adopted. Extending from the base of the crankcase is a small platform, upon which is mounted a countershaft box housing a sprocket wheel, the box being cut away sufficiently at the top to allow a portion of the sprocket to protrude. This sprocket is mounted loosely on the countershaft spindle, but can be locked solid, through the agency of a small dog clutch.



The Orbit auxiliary motor attachment. It is so small that it hardly adds to the width of the machine, and can be fitted to any bicycle like the Rudge-Whitworth illustrated above. This is the first model, as later designs drive the cycle chain by a sprocket engaging behind the crankwheel.

employed to drive the magneto, but as the armature shaft is set in a line with the cylinder above which it is placed, on a neat extension of the timing case cover, the final drive is by bevel wheels. The little cylinder is a wonderfully neat piece of work, and has very fine, deep fins. Oiling is adequately carried out, and a small pump, hand operated, is fitted in an accessible position on the cycle. Carburation is supplied by a baby A.M.A.C.

An Improved Model.

In future models the silencer will bolt direct to the exhaust port flange, and then carry a short extension pipe, while the attachment to the cycle frame is being improved.

The position occupied by the little engine is that of the bottom bracket, the holding-on lugs being at this juncture and on the front down tube. The angle of the cylinder is almost horizontal and its dimensions have been kept as small as possible, both in respect of length and width, and, as proving the extreme narrowness of the unit, the pedals completely clear every part. Viewed from the front the attachment can hardly be seen. The complete engine weighs somewhere about 18 lb. Fitted as it is to the bottom bracket, the weight is kept very low and very little strain is imposed on the frame.

The method of drive illustrated is experimental, and will

This gives, then, a free engine position, as on large motor-cycle gearboxes. The drive to this shaft is from the half-time shaft of the engine by chain to an outside sprocket similar to that now used. The sprocket engages the chain of the cycle immediately behind the front sprocket, and is always in position. This drive would be eminently suitable in conjunction with a two or three-speed hub gear, but for a single-speed cycle it is intended to embody a minute two-speed gear, operated by dog clutches and incorporated as part of the countershaft. The top gear is expected to be about $8\frac{1}{2}$ to 1.

The little engine, we are told, gives off quite exceptional power and has a fine turn of speed on the level. The petrol tank will not occupy the position shown, but will be carried aft of the rider on a kind of carrier. To take up any snatch which may occur when letting in the dog clutch, a shock-absorbing device is being embodied. Certainly no pains are being spared to offer the public a well-equipped attachment, and, considering that the price is expected to be in the region of £10, really wonderful value is being given.

The Bullet Two-stroke.

The Murphy horizontally-opposed two-stroke engine, of which we gave the first illustration and description last week, has now been christened "The Bullet," and it will be handled by the Birmingham Light Machine Co., of Deritend, Birmingham.

A MOTOR UNIT ON THE CARRIER.

The First Model of this New Attachment has been Completed, and Proved Successful in its Initial Trial.

VERY great interest has been aroused by the description and illustrations in *MOTOR CYCLING*, and also in our sister journal "Cycling," of the new auxiliary motor unit, carried over the back wheel, handled by the London and Westminster Industrial Syndicate, 8, Victoria Street, London, S.W.

The principle of the drive was described in our issue of 28th September. It is simplicity itself: merely by chain drive from the crankshaft to a sprocket wheel on a swivelling arm, that carries a fibre pulley wheel brought into contact with a V-section belt rim, spoked to the back wheel. A machine has now been completed and put through a test. At first it was doubtful if the fibre friction wheel would grip the belt rim. The inventor tried it up Pentonville Hill without the slightest trouble, and he had been riding the machine all the day, so was perfectly satisfied that the fibre wheel did not slip. The fibre disc can be made to slip contact with the rim, and thus serve as a clutch, which it has been found to do perfectly satisfactorily.

The engine which is fitted to the first machine is a four-stroke motor, with a bore and stroke of $52\frac{1}{2}$ mm. by 54 mm., which is the same size as the engine fitted to the Auto-Wheel. In future, however, this four-stroke motor will be replaced by a two-stroke engine of the same size, and the carburetter will be fitted just above the base of the cylinder.

Some little difficulty is being experienced in obtaining a magneto small enough to keep the weight down sufficiently. An improvement is a spring drive, which has been placed on the friction wheel shaft and allows of slip. A flywheel of



AUXILIARY POWER UNIT WITH REAR WHEEL DRIVE.

The new motor attachment for bicycles, as the first model, now completed, appears. The cleverly designed little power unit will probably sell for under £10, and has proved quite successful in its first trial.

smaller diameter will be fitted, but with a heavier rim, and the whole of the mechanism will be enclosed, so that it will be impossible for coats and ladies' dresses to catch in any part of the mechanism. The clutch is very handily controlled from a lever on the handlebar, so that if the rider wishes to pull up in traffic he can do so with the engine still running and start again without pedalling. A starting handle will also be fitted.

THE SERVICE SIDECARETTE.

A Strongly-built Outfit Designed as a Complete Unit.

AN attractive sidecar has been produced by the Service Co., Ltd., 289-293, High Holborn, London, W.C. The machine is a two-stroke, fitted with a Peco engine, with patented oiling device. The capacity is 349 c.c., and the horse power is rated at $2\frac{3}{4}$ -3. The Amac or Senspray carburetter will be fitted at the option of the purchaser.

A particularly interesting feature of the machine is that a specially strong frame is used to make it suitable for sidecar

work. The frame is, in fact, as stoutly constructed as those used for $3\frac{1}{2}$ h.p. machines, and the Druid forks fitted are also amply strong enough for the work for which the machine is designed. The rims are 26 ins. by $2\frac{1}{4}$ ins., fitted with 26 in. by $2\frac{1}{2}$ in. Hutchinson tyres.

It will be seen therefore that the outfit is not an ordinary motorcycle to which a sidecar has been hitched as an after thought. It is a carefully considered passenger machine, designed as a unit, the type of sidecarette, in fact, that we have often recommended makers to produce.

According to the wish of the purchaser an Albion or Stewart-Turner two-speed countershaft gearbox will be fitted. Other features are Best and Lloyd drip-feed lubrication, aluminium footboards, and a large tank of pleasing design.

The sidecar has an underslung chassis and quickly-detachable joints. The body is made of three-ply wood, is handsomely finished and upholstered, and gives plenty of leg-room. A storm apron is supplied, and this completely covers the sidecar when no passenger is being taken. A large locker is provided underneath the seat, so that spares, oilskins, etc., can be carried.

The complete outfit sells at the low price of £50, plus five per cent. to cover the present high price of material and labour. Such a well-designed sidecarette should find a ready sale.



The Service sidecarette, a well-designed outfit with $2\frac{3}{4}$ -3 h.p. Peco engine and specially strong frame.

ALL THE WAY.

Jerry Bang at Last Reaches Brighton.

AFTER the first disastrous exploit of my redoubtable friend with his venerable crock, and knowing his weakness for confusing the oil and the petrol tanks, it did not seem probable that he would ever ride a motor-bicycle with success. Indeed, calling round one night to inquire if the bill for all the damage had been settled with satisfaction to both parties, I found that he had gone to the length of pasting labels on the respective petrol and oil filler caps—and, of course, had labelled them wrongly! But he did master that weird and wonderful machine, and, although Brighton seemed as far off as ever, dazzling prospects of one day creating a furore at that celebrated resort were frequently held out to me, and at last the success was achieved. Over his countless troubles in intervening efforts I draw a veil; suffice it to say that, for me, motor cycling had become, as I forecasted it would at the beginning, merely one perpetual tinker by the roadside.

The day that we were to descend upon Brighton was, appropriately enough, the 1st April. Needless to say, when we started I had not the faintest hope of getting even as far as Crawley. Jerry, however, had other ideas, among which a tour of the south coast to Portsmouth was under contemplation, and a return to town from there—all in the day, of course.

When I arrived at Laburnum Lodge to assist in the usual office of helping the crock down the front door-steps to the street, an astonishing sight met my eyes—Jerry's new motor-cycling get-up.

"What do you think of it?" asked its originator proudly, strutting round the garden path like a peacock displaying its tail.

I could only murmur "Wonderful!" and gasp.

If my views, which are by now fairly well known, regarding the evil practice of wearing a cap the wrong way round needed a striking illustration of their most appropriate application, Jerry supplied that want. Beginning with a cap two sizes too large, of a particularly striking sponge-bag pattern, he had, with great ingenuity, secured it to the nape of his neck with the aid of a pair of goggles (minus a lens), one broken strap of which was repaired with a piece of string. The coat, tinged a ruddy brown, was of a fashion that appears prominently in the advertisement pages of the illustrated weeklies, and is generally understood, because of the curtain-like folds in the back and its general air of discomfort, to be the type invariably worn by distinguished golfers. The waistcoat, of an orange wool, trimmed with green, set off the aforementioned garment to perfection, aided by a tie of a magenta hue. The breeches appeared to be designed for a hunting squire of generous proportions, for which again the inimitable sponge-bag material had set the pattern. Add to this a pair of slack leather gaiters, with mysterious tin discs strapped to the inner sides, as protection, I learned later, against the furnace that raged below the tank, and you have a partial idea of the weird individual who wanted to accompany me to Brighton.

Contrary to all rules and precepts, the engine of the famous 3 h.p. Hold-the-Road condescended to fire

at the first lunge of the pedal applied by its redoubtable rider, and spluttered and banged along in its best style, which was neither very even nor very certain. However, we certainly averaged 15 m.p.h. to Redhill, and I permitted Jerry to take the entire credit for this remarkable phenomenon. It was really so extraordinary that I considered the occasion worth celebrating with a drink, so we stopped.

"You see, old chap," he explained, by way of an apology I suppose for the cutting remarks that followed, "there is no doubt you know a great deal about modern motorbikes, but your ignorance of older mechanics is really profound. There's no doubt I've got a bargain, and it ought to be worth quite a lot of money when I sell it."

I agreed, nervously regarding the interested attention of Redhill's population, attracted, I doubted not, by Jerry's magnificent appearance, and added, "I've heard that a museum for preserving specimens of ancient motorcycles is about to be formed; you certainly ought to let the secretary know about your find." This was entirely lost on Jerry, as he picked up the ginger beer I had ordered for him, and murmured plaintively that paying twopence for penny ginger beers was sheer waste of money.

"I tuned the carburetter, you know, and the spark, and screwed the cylinder down; it's made all the difference."

"Did you get those spare jets?" I asked.

"No; you see, they were sixpence each, and I thought out a way of altering mine with a darning needle and a hammer."

"Excellent!" I commented, "and then found the hole too big and knocked it down with the hammer?"

"Well, I thought it made rather a difference, so I cut off a bit of the jet with a file, and that's made it smaller."

"It's an ingenious method," I remarked, "and, if you continue your experiments long enough should produce some really wonderful results."

"Yes, that's just what I thought," said Jerry. "I think I'll send it along as a hint and tip to the papers. I shan't send it to one, but to all of them, so as to be fair. How much do you think they would give me for it?"

"Oh! they'll return your MSS. if you send a stamped addressed envelope; it's quite usual."

Further discussion was diverted by the entrance of a couple of motorcyclists, loudly proclaiming that they had discovered the most wonderful crock on earth, and as its proud owner came into view their astonishment was visible, even if the wink from one to another was imperceptible.

Jerry drew himself up proudly, re-arranged the folds of his nether garment, and informed me in a loud voice:

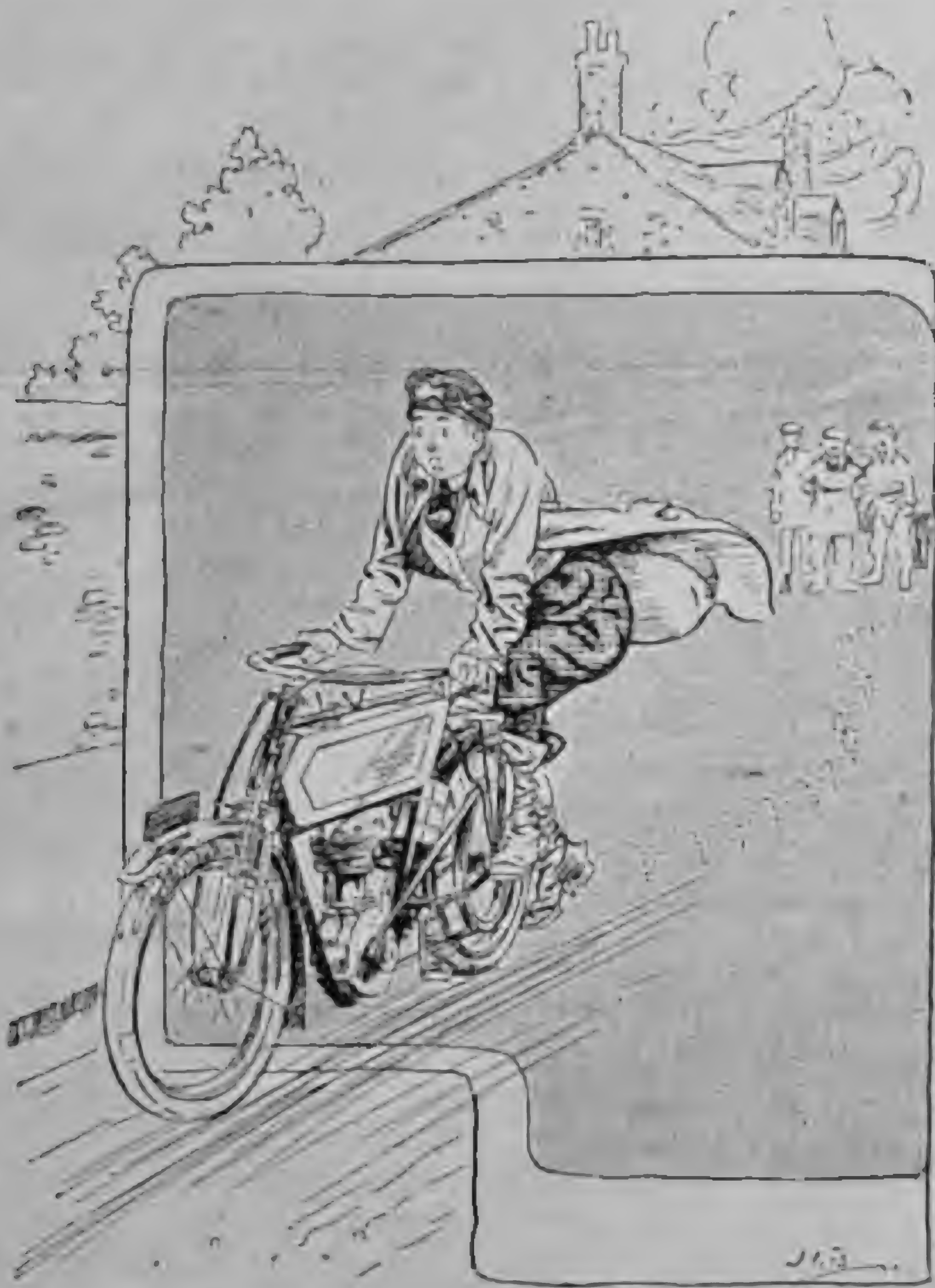
"You know, it will do 35 up any hill since I tuned it. Come on, we'll get on, we've got another 200 to do yet."

"Swank!" I said to Jerry in an undertone as he strode towards his machine. "You conceited little bounder!"

All the Way (contd.).

The motorcycleists moved to the door to see the strange spectacle of this human rainbow mounting his piece of antique ironwork. Indeed, it was a diverting spectacle. The first thing that happened was that Jerry, in all self-consciousness, having lifted it off the stand, allowed the 2 cwt. of old iron to overbalance and fall to the ground with a crash that shook the whole street, and, overbalancing himself, fell across it likewise.

I assisted him to rise, noting that the furious blush that suffused his countenance added one more tint to the spectroscopic range of his get-up, and sympathetically offered to give him a shove.



"Then, placing one foot on the step, . . . he hopped down the street, performed a perilous swerve, and reached the saddle."

"Thanks, I can do it myself," he said ungraciously; "it's not like your wretched machine for starting." Then, placing one foot on the step (a survival of his early cycling days which no persuasion would ever induce Jerry to dispense with), he hopped down the street, performed a perilous swerve and reached the saddle, pedalling lustily towards Brighton.

"On a cycling tour?" inquired one of the newcomers festively.

"Oh! no; my friend's the greatest motorcycleist who ever lived," I replied suavely, picking up the carburetter, which, unnoticed, had fallen off, from out of the gutter; "but he does not like to give up taking exercise altogether." Jerry, still pedalling furiously, was but a speck in the distance.

"Is he doing it for the pictures?" asked the other motorcycleist. "Come on, let's follow."

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I placed the carburetter in the sidecar, and we three proceeded slowly in the wake of the energetic Jerry, who was being loudly cheered on his way by ribald onlookers. Indeed, I doubt if Redhill had ever observed a more elating incident.

I overhauled the redoubtable one. "Half a minute, Jerry, the——"

"I don't want your assistance," he snapped breathlessly, "it's sure to start soon," and then, exhausted, came to a stop on the hill. "Where's the petrol coming from?" he asked in astonishment, regarding the broken pipe in dismay.

I stopped and turned the tap off, and presented him with the battered carburetter. "You'll have to take it to a garage," in which direction we proceeded, not without some argument regarding the advisability of first attempting a repair without calling in expert and highly expensive assistance.

Fortunately, the repair of the petrol pipe was all that was necessary, and as it received a much-needed annealing, could hardly be regarded as an unfortunate experience. The detachment of the carburetter from the inlet pipe was largely a matter of Jerry's persistent tuning, and the ruinous effect of bad usage of a spanner. However, with the aid of insulating tape, we made good the lack of an effective union, and, with Jerry the poorer by the "extortionate" sum of one shilling, proceeded on our way.

Once more "the world went very well then," according to Jerry, who was making a strange noise, intended to be a song of joy. We proceeded quietly through Crawley, my suggestion that it was lunch time and that we ought to feed there being met with very pointed remarks regarding what happened the last time I had called a halt. Two ribald motorcycleists yelled lustily after Jerry, who turned uneasily in the saddle; but I drew his attention to the fact that it was the 1st April and stopped not.

"I'm sure something's fallen off," he remarked; "why not stop a minute to see?"

"Come on, Jerry! Stop a little further on if you like, but not here," I protested, and a mile out of the village stop we did. Then began a minute examination of the machine, but nothing would satisfy Jerry but to go back, and I let him go by himself, while I smoked a pipe. I smoked two, then three, and, finally, I turned the sidecar round and made for Crawley. There, in the centre of the 10-mile limit, I found him arguing with the police, Jerry protesting that in all his cycling days he had never, never exceeded 10 m.p.h., and would not be likely to do so now, and generally making an exhibition of himself. And when I had finally persuaded him that no amount of argument could make any difference, and that threatening to write to the papers would only produce a hotter fire, he allowed himself to be led off to a place where we could feed, which was the one good thing we did that day.

Now it never occurred to either of us that a broken petrol pipe, entailing much waste of petrol, would inevitably lead to a shortage of that commodity. Further, as we proceeded up the long hill that leads to the top of Handcross, Jerry insisted that I should go in front and not hang about for him. A quarter of an hour after I had reached the village, and had waited patiently for the arrival of "The Humming Bird," there was still no sign of Jerry, so I had perforce to return. I found him, with the aid of a

All the Way (contd.).

perspiring tramp, valiantly pushing the machine slowly but surely towards Brighton, and in a very bad humour.

"What's up?" I asked.

"Your tinkering with the machine in the garage," said Jerry most ungraciously. "I knew you'd do something. Before it stopped, it gave a piercing shriek, so I expect you've completely wrecked the engine. I knew you would. Here, catch hold of it, I'm fed up! Ten pounds clean gone!"

"Let's see what's the matter," I said. "You know you made me go on ahead; it really isn't safe though to desert such a complete novice as yourself."

"Well, anyway, I tuned the machine and I've got it as far as—where are we now?"

"Just about 19 miles from Brighton."

"Why, we could do it in an hour! Can't you see what is wrong? Let me have a go!" Jerry was recovering in his usual lightning manner.

Two seconds served to show that the tank was dry, a discovery which I announced, but which was claimed at once as his own theory by Jerry.

"Just what I thought—no it isn't," as he screwed off the lubricator cap. "Oh, that's oil!"

I helped him fill up from a spare can off my sidecar and suggested dismissing the waiting pusher.

"Wot abaht it, guv'nor?" asked that worthy in the expectation of the price of a drink.

"Give the man twopence, Jerry," I said.

"Give it him yourself," said that worthy.

"I wants fawpence for shuvving the bike; tain't likely I'm going to push it four miles up a 'ill for tuppence!" observed the tramp.

As we neither of us had any coppers, the deal was satisfactorily settled at 6d.—and I paid, of course.

Once more we sped towards the sea; that is, I sped and Jerry's crock spluttered. We reached the top of Handcross Hill, and then a dreadful thing happened. The belt on his machine parted and fell off, and down the hill he flew, the engine running free, roaring away all out. A few moments later I heard the inevitable sickening crash.

Half-way down I found the remains. Jerry's body was protruding from a hedge, which, if prickly, was at least comparatively soft, and the bike lay in the gutter, with bent front forks as the only visible sign of damage. From its owner weird sounds were proceeding, in which I could distinguish such expressions as "Ten pounds clean gone," "I'm done for," punctuated with particularly awe-inspiring groans.

Tenderly I extracted his battered form, and inquired for information regarding the damage, which a casual inspection failed to reveal. He protested vigorously that he was broken up all over, and that I'd better leave him to die in peace. Being unable to see why, I resorted to more tactful methods, and in the intervals between the curses that he heaped upon my head, the machine, and everything connected with motor cycling, I got the famous "Hold-the-Road" on to its stand.

"This is a wonderful bike, Jerry," I said, in a peaceful moment; "it's not hurt in the least."

"What?" he exclaimed, sitting up.

"Only bent the forks slightly; I can soon straighten them. There's no doubt it's good value for the money." Jerry rose to his feet abruptly and felt the machine tenderly.

"Do you think it's broken the frame?" he asked.

"No, it's quite all right."

"What about the engine?"

"Fine!"

I straightened the forks, recovered the belt, which a passing carter had picked up and handed over, and repaired it, and somewhere about 4 o'clock we were once more proceeding Brightonwards.

It was on the last steep rise that the next catastrophe occurred. The engine of Jerry's crock had been giving less and less signs of animation, and finally stopped with such suddenness that its owner fell off into the road. The cylinder was red-hot.

"I suppose you've given it plenty of oil?" I asked.

"The tank's quite full," said Jerry.



* Half-way down I found the remains. Jerry's body was protruding from a hedge, . . . and the bike lay in the gutter."

It was: to the brim! And that wretched novice had not given the engine a solitary pump of oil.

Over the four hours that it took us to reach Brighton; of the painful endeavours to get that engine to fire again once it was freed; of the nightmare experience of towing an absolute idiot who could never find the brake at the right moment, I draw a veil. Somewhere about 10 o'clock we looked up an ancient feminine relative of Jerry Bang's, after depositing the machines in garage for a general overhaul, having particular reference to the battered condition of the back of my sidecar and the rear wings. She received Jerry with the kind of welcome extended to an invading enemy, but condescended to give us a night's hospitality.

"I've done it!" said Jerry proudly. "I always knew I could get to Brighton."

"THE OWL."

SIDECAR TOPICS.

Sidecarring in Chilly Weather—Does the Passenger Feel the Cold More than the Driver?—The Best Clothing—How to Dim Acetylene and Electric Lamps.

THE recent snap of cold weather was a reminder that winter is approaching, and that the time has arrived when we must think about warm clothing if we hope to avoid chills and other ills. As a matter of fact this is the most dangerous time of the year. In the middle of the day we often get bright sunshine that lures us far afield, for it seems as if summer were still with us. But as soon as the sun sets the temperature flops down, and then if we are caught out with nothing but our summer kits to protect us from the cold we provide excellent practice for our doctors.

These trite truths were brought home to me vividly during a recent run to the Midlands. In company with a friend I started away from London on a new 8 h.p. sidecar outfit. We had a run of 110 miles to complete, and only two hours of daylight; it was raining, and there was a cold north wind blowing directly in our faces. Consequently, the outlook was not inspiring. On this occasion I was the passenger instead of the driver, and before long I began to wonder if my ideas about the luxury of the modern sidecar had not been rather exaggerated. Often when I have been driving in bad weather I have looked at my passenger with envy, for, snuggled under a rug, he or she as the case might be has looked very comfortable. But on this ride I began to realize that one may feel the cold even more in the sidecar than when one is on the saddle. It is difficult to explain it, but it is an unpleasant fact that an icy draught seems to circulate round one's



Eddies of cold air are directed into the passenger's right ear and down his neck.

feet. I do not know where it comes from, apparently the current of air is deflected by the body and the back of the car and flows downwards. Of course, I had no windscreen, as I regard such a fitment as out of place on a sporting outfit intended for long, swift journeys. Also, I have found in the past that wind-screens unless they are provided with side pieces are not so efficient as they appear to be at first sight. Eddies of cold air seem to wander round the screen, and are directed by the body of the driver into the passenger's right ear and down the back of his neck.

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I admit that it seems strange that a person who is used to driving in all weathers, through winter and summer, should complain about the comparative protection of the sidecar, but I can only speak of my own experience. If I had to travel a hundred miles through a storm of sleet I would infinitely prefer to array myself in waders, oilskins, and a sou'-wester, and brave the elements while on the driver's saddle than take the seat of the passenger.

However, it is possible to mitigate the discomforts, and I think if drivers occasionally took a ride in their sidecars they would be a little more sympathetic



When the locker is under the seat instead of being placed in the back of the sidecar.

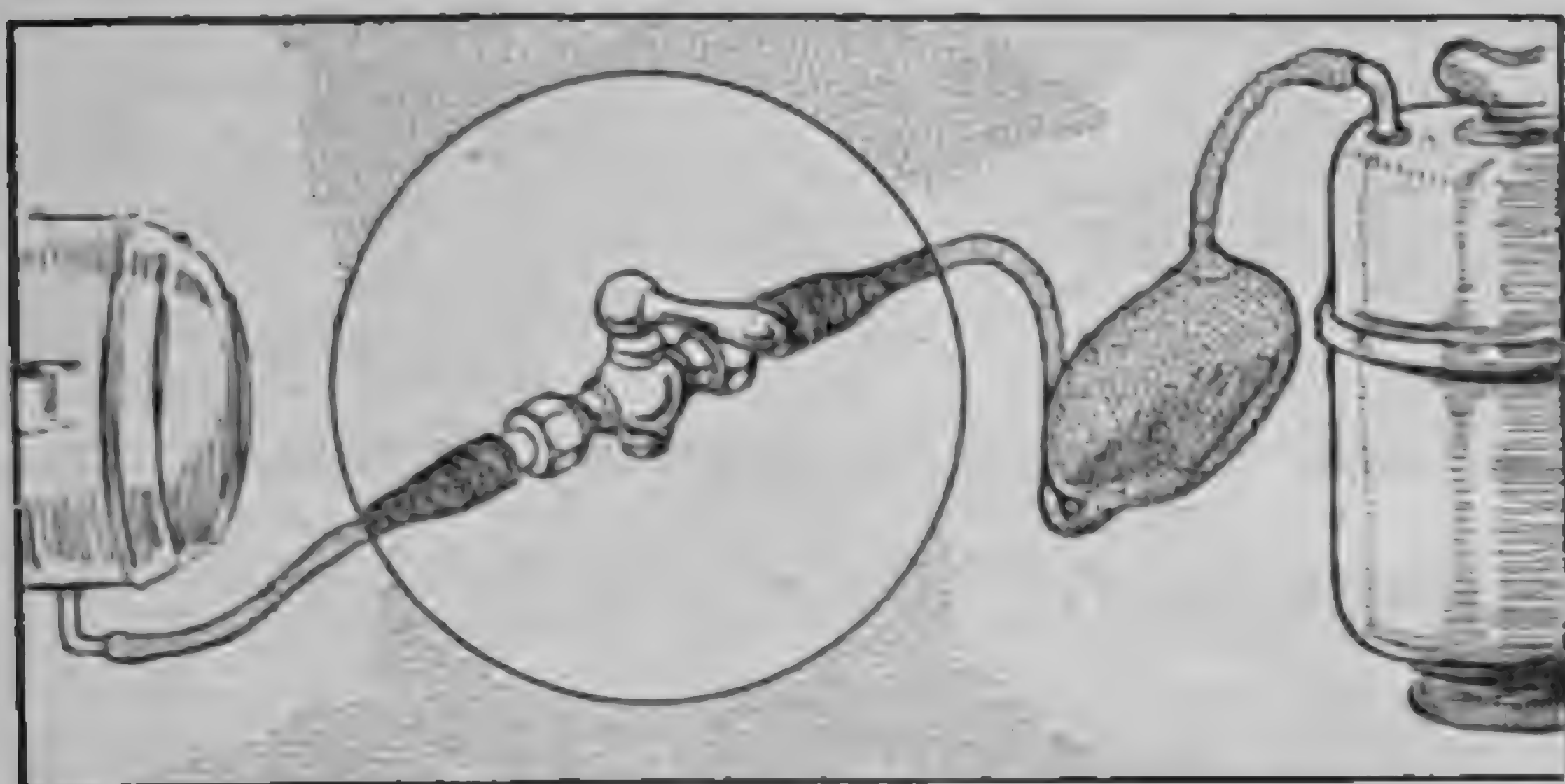
towards their passengers afterwards. In the first place there should be some provision for keeping the sidecarist's feet warm. The opulent may invest in a fur-lined "cosy," but if this is too expensive an item an armful of straw in the toe of the car will prove just as effective. A warm rug is a necessity, and a storm apron that reaches up to the neck and buttons closely round the bodywork of the sidecar is equally desirable. If a sou'-wester is worn it is most comfortable when it is drawn over a woollen cap which should first be pulled over the ears and well down to protect the neck. If this is not done the wide flap of the waterproof cap acts as a wind scoop and diverts the cold blast directly down one's neck. The best possible clothing for warmth is a fleecy woollen coat with an oilskin over it and a leather waistcoat may be worn under them if necessary. The driver should be similarly equipped with the addition of waders. Clothed in this way it should be possible to face any weather without real discomfort.

By the way, I do wish all sidecar designers would provide a capacious locker at the back of each of their models, so that extra clothing, tools, etc., could be taken out without the necessity of disturbing the passenger. A good many enterprising manufacturers have realized the advantage of this arrangement, and it is quite time that it became universally adopted.

Sidecar Topics (contd.).

I note that according to the latest lighting regulations for the Metropolitan area all vehicles are required to carry a red rear light on the *off* side of the machine. Until now we have been allowed to place the lamp in any position so long as it was visible from the back, and many sidecarists have carried a lamp on the sidecar which showed a white light forward and a red one to the rear. These are now illegal in London, and the only form that satisfies the authorities is apparently a red lamp affixed to the carrier. For a good many drivers this means the immediate purchase of a new lamp.

The lighting problems are really becoming increasingly difficult. For instance, during the run to the Midlands to which I have just referred we were using



A small tap between the lamp and the generator enables the rider to turn down the light when passing through a town.

electric lamps. In the open country we could use the light undimmed, but whenever we approached a town we had to stop the machine and put a piece of white paper into the lamp. When we had put this in and taken it out again about a dozen times we began to feel that the method was rather primitive.

I think that at the present time makers of electric lamps ought to fit two bulbs, one of high-candle power and one that would give only a glimmer of light just sufficient for town driving. With a two-way switch it would be possible to conform to the regulation without trouble. Lamps of this kind have for a long time been in use in America where in some States "anti-dazzle" laws exist, which make it an offence for a driver to use very powerful lights in towns. The small electric bulb is often placed just under the hood of the lamp in a little compartment.

The user of acetylene lamps is faced by a more difficult problem, for though he may turn off the water regulator on his generator the light is not dimmed for a considerable time. What I want to see is a sort of roller blind that could be drawn down when desired and allowed to spring back when a full beam of light could be used.

Failing something of this sort a small tap might be placed between the generator and the lamp, so that the light could be turned down. The difficulty in this case is that the gas would be generated for a time more quickly than it would be burnt, and in extreme cases the rubber tube might be blown off one of its connections by the pressure. If the water were turned off some time before the light had to be reduced, and if one of the special connections with a little rubber bulb were used, this difficulty would, however, probably vanish.

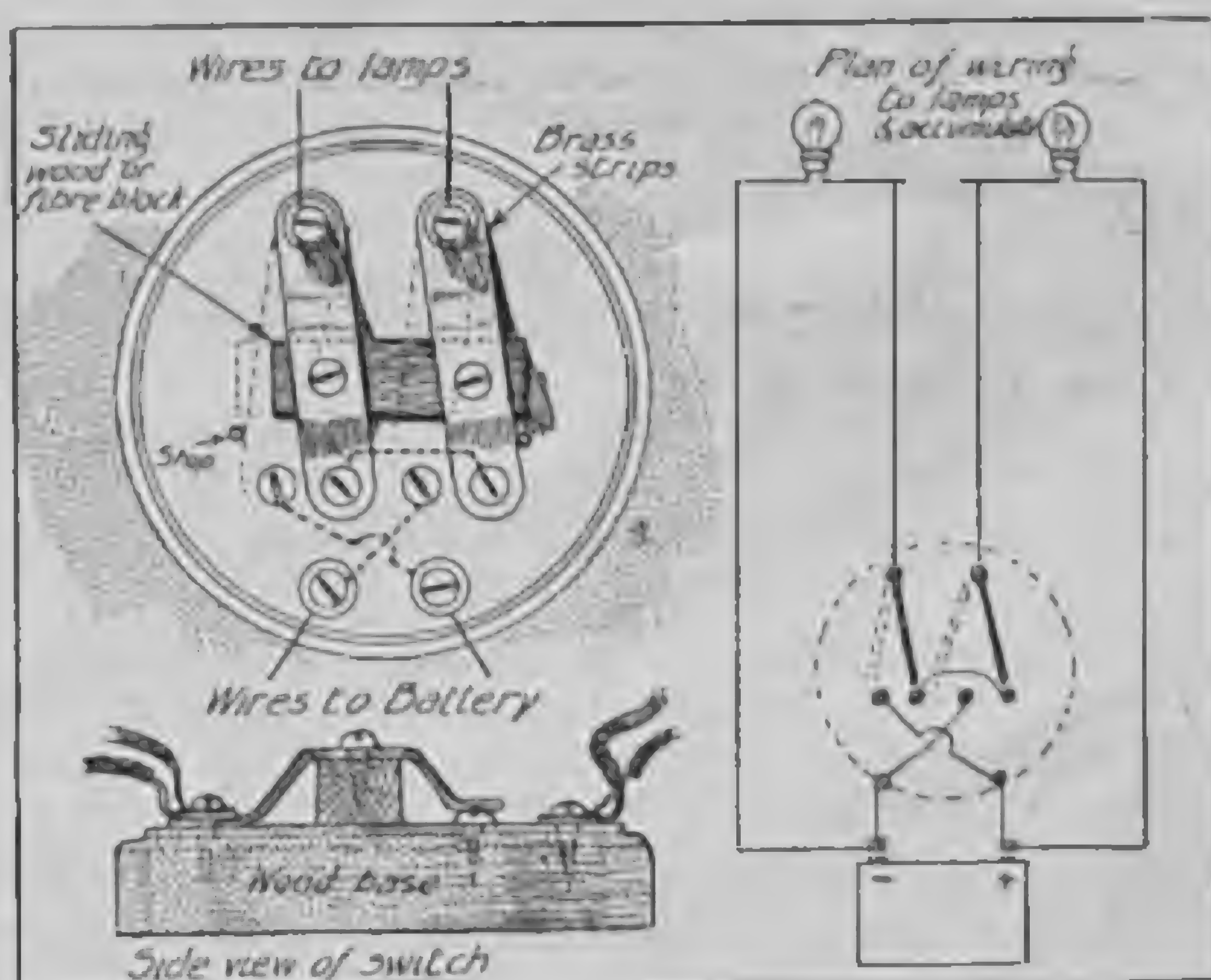
To return to electric lamps for a moment, it is, of course, possible to have a small resistance coil fitted, which will enable the driver to regulate his light to a nicety. The disadvantage of this method is that the same amount of current is being used when the light is very dim as when it is giving off its full candle-power.

Another method is to have the wiring of the headlamp and sidecar lamp so arranged that they can be run either in series or in parallel. The diagram will make this clear. When the lamps are connected in series each one gives but a dim light. When switched on in parallel the full light is, of course, obtained.

A switch such as is shown in the illustration could be made at home by anyone who is fairly handy with tools. The base might be a circular or square piece of wood, while the moving parts could be made of ebonite or wood. The terminals and screws might be obtained for a few pence from any dealer in electrical fittings. Of course, the switch could be elaborated, and it might even be made into a handsome fitting if neatly encased, but I will leave these points to be worked out by the ingenuity of the reader. Once the principle has been grasped, it is an easy matter to devise the details of the switch.

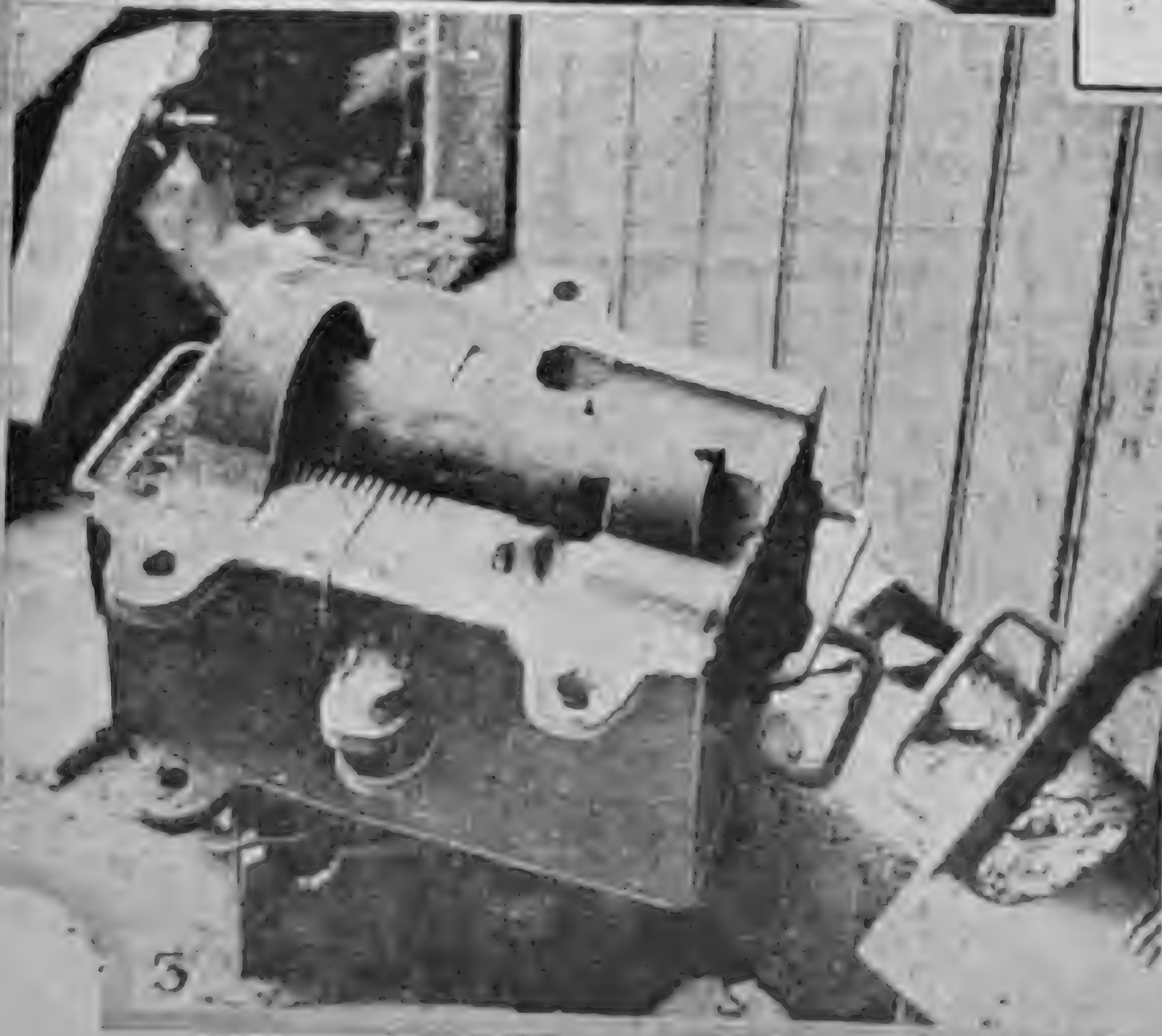
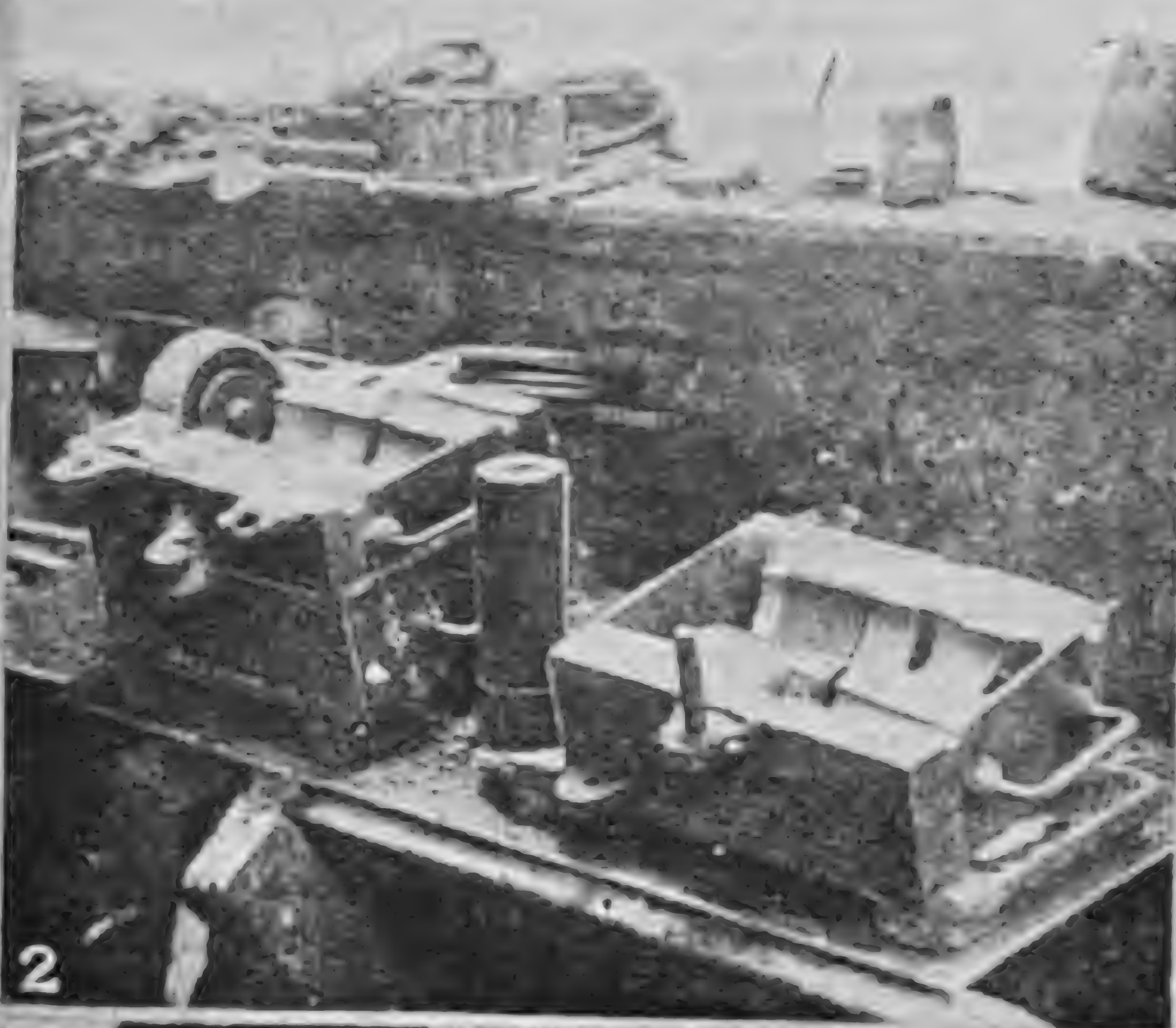
A motor-cycling noter in the public Press has been denouncing the practice of attaching featherweight sidecars to lightweight machines. These sidecigarettes, he thinks, are likely to injure the pastime, as he suggests that they are certain to give trouble. He is annoyed because a certain section of the Press recommends the practice, and his attack seems directed against this journal, which he describes as one that is usually "capable and sensible." However, he is quite wrong in his interpretation of the remarks that have appeared from time to time. It has never been suggested that sidecigarettes should be expected to do the work of higher-powered machines, or that sidecars should be attached indiscriminately to any motor-cyclette. What we have proposed is that makers should turn their attention to the production of the simple and economical sidecigarette combination *designed as a unit*. This some of them have done with excellent results.

THE GIPSY.



A switch that enables a sidecarist to run his headlight and sidecar lamps in parallel or in series. When in series the light is dimmed. Such a switch could be made at home.

THE EVOLUTION OF



A MOTORCYCLE may appear to the uninitiated to be a comparatively simple piece of mechanism, but those who can see beneath the enamel and nickel with the X-ray eyes of knowledge know that a modern machine is the result of an incalculable amount of study.

Even if we put aside the electrical and mechanical problems involved, we find that the actual production of a power-driven cycle is only possible as a result of countless generations of men who have brought the science of metallurgy to its present position.

Consider for a moment the different rôles that metal has to play. In some parts it must be springy, in others rigid. Certain spindles have to be almost as hard as a diamond on the outside, but comparatively soft within, for the reason that if they were hard all through they would be almost as brittle as glass. Hard metals in a bearing must work in bushes of softer metal if wear is to be avoided; parts must be forged, others cast, some turned from the solid. Metal is magnetized, drawn into wire thinner than hairs, woven into coils, wrought into chains, coated with other metals by electrolysis, and fitted for dozens of different duties.

It is impossible to deal with all the processes unless one proposes to fill a huge volume, but, just as a beginning, it is interesting to follow the methods by which a crudely-shaped "pig" of iron is transformed into the delicately-moulded cylinder of a modern air-cooled motorcycle engine.

Probably, at some time or other, most motorcyclists have wondered how these cylinders, with their thin fins, all perfectly shaped, are formed. It is easy to dismiss the whole subject with the simple explanation that they are cast—but how? Unless one is



(1) The first step: placing the sand and nails on one section of the wooden pattern. (2) The two halves of the mould. Note the core of iron flowing out of the cupola into the receptacle in which it is carried. (3) Removing the sand and polish to the interior of the cylinder. In the centre (from top to bottom) are shown: The wooden pattern; a two-stroke cylinder as it has been removed. The cylinder com-

ON OF A CYLINDER

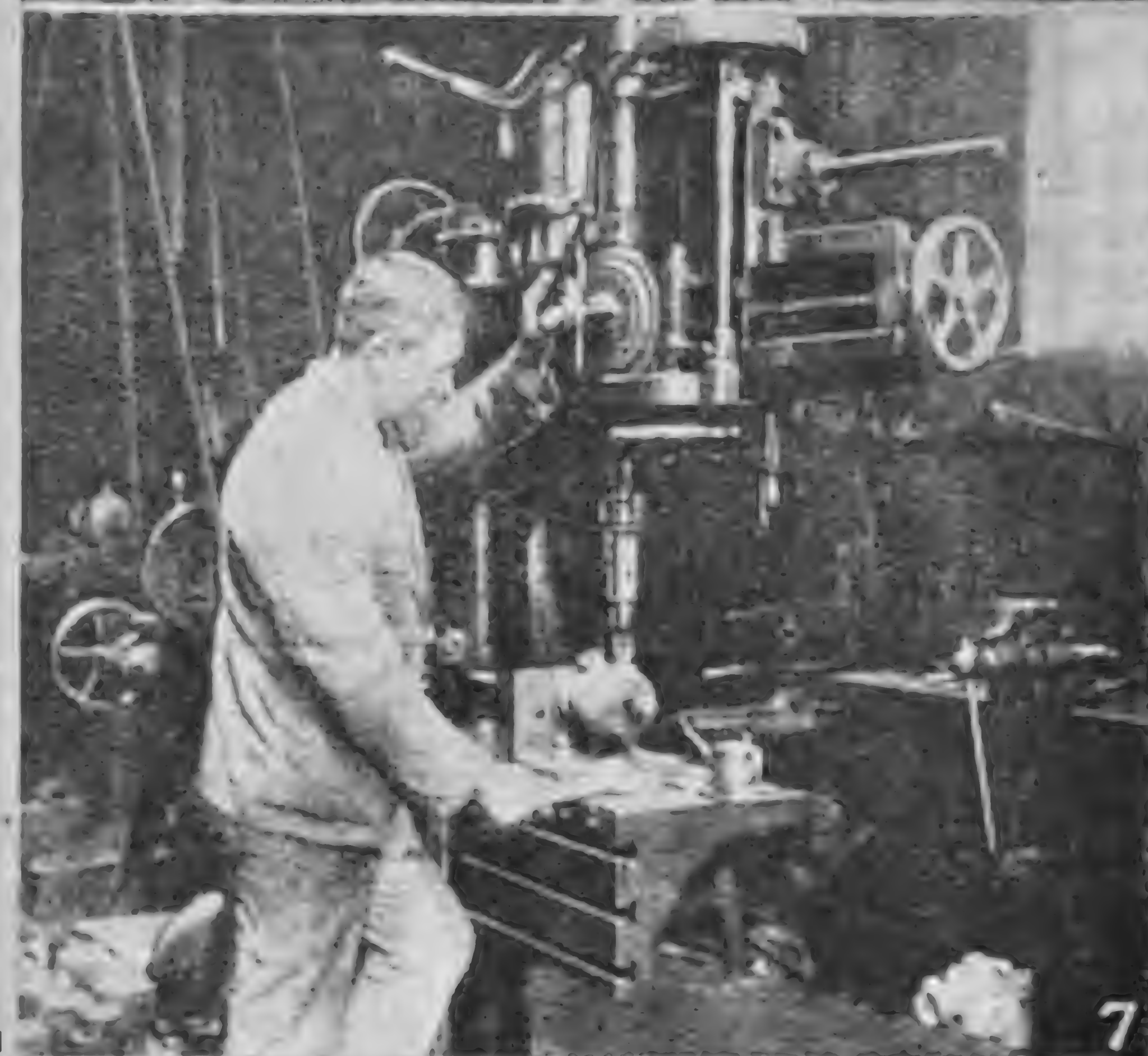
familiar with the arts of the iron-founder, it is difficult to understand how a mould can be made. One wonders if a cylinder is cast in two pieces and then joined. If the mould is made of sand, how in the world do all the little-channels that form the fins remain in position!

To understand the processes, one must follow them step by step in a big foundry such as that of Messrs. Wiseman and Harris, Ltd., of Glover Street, Birmingham, where cylinders are not only cast but finished and sent out ready to be fitted.

First we are shown the pattern. This is a model of the cylinder turned in wood. We note that it is made in sections: two half-cylinders and the head. When placed together we see the exact shape of the *exterior* of the casting that is to be made.

This pattern is taken to the shop where the moulds are made, and each section is laid down on a wooden board, while "sand" is pressed round it. The sand is nothing like the seaside variety with which we used to build castles. It more closely resembles finely-powdered earth. The best for the purpose comes from Mansfield, where it is dug out of quarries. It is mixed with a small quantity of coal dust, and is ground in a mill. It is slightly damp when it is placed round the wooden pattern, so that it will bind.

However, it cannot be relied upon to remain in position when the pattern is withdrawn, so the more delicate parts have to be supported. First a layer of sand is plastered over the wooden shape until the fins are covered. Then long, slender nails are carefully pressed into the sand between the fins. A large number of nails are used, and when the operation is complete the work looks like a horror-struck hedgehog. These nails keep the sand from slipping.



the mould. Note the core between them. (3) The core in position. The two parts of the mould are now fitted together. (4) Molten metal being poured into the mould. (5) Removing the sand and nails from the casting. (6) Boring and tapping the parts. (7) The emery wheel which gives the final finish. (8) The cylinder completed.



Sympathetic Novice : "I say, if you want a bit of copper wire, you know, I have some."

The next step is to place the sand-coated pattern in a box packed with sand, which is pressed down tightly, and then the mould is baked.

The same processes are carried out with the other sections, and when they are completed we have the moulds as they are shown in our photographs. But it is clear that if metal were poured into the moulds when they had been fitted together, the result would be a mass of metal externally of the desired shape, but solid. Consequently, a core has to be inserted. This is also made of sand, and is supported at both ends. Two little channels are then made in the moulds. One is for the metal to be poured through, and the other is to allow surplus metal to flow from when the mould is full. It will be understood that the "sand," after being baked, is quite hard, and looks rather like rough earthenware, and that it is contained in iron boxes, which are clamped together. All is now ready for the casting process.

This is usually carried out late in the afternoon, for during the day the big cupolas in which the iron is melted have been doing their work. Electrically-driven blowers have been fanning the furnaces to a white heat. Two men bring a big iron cauldron, lined with sand and fire clay and provided with two long handles. This cauldron they place on the ground beneath a trough along which the molten iron will flow. Another man approaches with a long bar of iron, with which he makes an opening, through which the liquid metal flows. It is about the consistency of syrup, and gives off a dazzling light and vicious heat. It looks venomous, and one shudders to think what would happen if it overflowed. This flowing stream of iron lights up the faces of the workers like sunshine.

In a moment the cauldron is full, and the two bearers carry it swiftly to the casting room, while other men with other cauldrons take their places by the gleaming stream.

If a visitor happens to be standing in the way of these men he will be startled by a warning shout, and when he looks round and sees them apparently about to charge into him with that bucket of infernal fire, he will be more than human if he does not show magnificent acceleration in his attempt to reach the other end of the shop.

The molten iron is poured rapidly into one mould after another until all are filled. When the metal has cooled, the moulding boxes are opened and the cylinders are removed, with sand and the supporting nails still clinging to them.

In another shop the nails are withdrawn, the sand scraped away, and then the castings go to another department of the works, where cunning lathes and emery wheels make their interiors smooth as glass, while other machines drill out and tap the apertures for the valves, inlets, exhausts, and compression tap openings.

When all is complete, each cylinder is tested by hydraulic pressure. The machine for carrying out this is quite simple. It is merely a table with a small hole in the centre, through which water can be pumped. A leather washer is put round the aperture, and over this each cylinder is placed and bolted down tightly. Then the pump is used, and water is forced in until a gauge registers a pressure of 800 lb. to the square inch. Occasionally a tiny stream of water will disclose an imperfection in the casting, but if the work is carried out as carefully as it is at the foundry of Messrs. Wiseman and Harris, faults are rare.

And thus a motorcycle cylinder is made. When the reader takes his down next time, it may interest him to examine it with greater attention than before. He will find it is a beautiful example of the craft of the iron-founder, for many brains have been at work over its production.

THE EDITOR'S CORRESPONDENCE.

The Editor is not responsible for, neither does he necessarily agree with, the views taken by correspondents. Both sides of any topic are given equal publicity. A pen-name or initials can be given for publication, but the writer's full name and address must always be sent. All communications should be written on one side of the paper only.

MORE WRONG AND RIGHT-WAY-ROUNDERS.

Another Right-Way-Rounder.

When first taking up motor cycling I set myself definitely against appearing in public arrayed as the personification of frightfulness and barred goggles and the wrong-way-round habit. To the former I had to succumb, as I found on long runs the strain on the eyes was too great, but I have discovered a thoroughly efficient remedy for the greater evil. I wear a cap of waterproof material which lies fairly flat on the head, and had a leather band from an old bowler hat sewn inside. Instead of fitting it quite straight, however—that is to say in the form of a cylinder—it was sewn so as to be slightly conical in shape. The result is a perfect fit without being so tight as to cause headache, and I have not experienced the slightest trouble since.

SANITY.

Purley.

Even From Russia.

"The Owl" is just a little too unkind in his humorous and sweeping attacks on us poor adherents of the peak-behind style of wearing the cap. We do not object to being called motorcyclists, even by the "superior" people who frequent first-class hotels, although we should prefer that no inverted commas be understood, but we do not like to be termed "bounders" whatever may be the precise meaning of this epithet, and we disclaim any connection with "hooligans." What can we do, however? "The Owl" has not invented for us a style of headgear which will give us the same convenience and comfort without offending the eye of the "superior" people. He is surely wrong in stating that the peak of the cap appeared at the back of the motorcyclist's neck before the goggles on his forehead. My experience is that it is precisely the necessity for wearing goggles in such a manner that they can be instantly let down with one hand whilst using the other hand for steering, which compels the peak of the cap to take a back seat on the neck. This position of the offending peak also serves the double purpose of protecting the back of the head from dust and prevents the nasty door-mat feel at the end of a dusty ride. There may be "motorcyclists"—this is where the inverted commas come

in—and I daresay there are, who adopt the peak behind style with goggles stitched on in front from a desire to put on motor "swagger." This is the breed that generally dies a natural death.

After all, where does the offence come in? Ladies wear their feathers sometimes in front and sometimes at the back, and all round the compass, as fashion dictates, and although in this case convenience is not the guiding principle, yet they are not "bounders" as a result thereof. When the peak first made its appearance on the cap, if it had blossomed on the back instead of the front, no doubt that position would have been considered the proper one, just as the Chinese consider the proper way to write is from the bottom upwards, and then any person who had dared to show the peak in front for convenience, say to avoid the sun's rays in his eyes, would have been dubbed a "bounder" or something worse by those super-sensitive people who are slaves of fashion and despise comfort and convenience.

G. E. COUPLAND,

Moscow.

Hon. Sec. Moscow Motor Cyclists Society.

Ugly and Uncomfortable.

I certainly agree with all those who think the cap should be worn the right way round. Not only does it look ugly, but it is uncomfortable to have a peak of the cap sticking into your back. Even if the cap be a very loose fit a pair of goggles fastened just over the peak will prevent any cap from coming off, and can easily be pulled down if very dusty. I have ridden thousands of miles like this.

A RIGHT WAY ROUNDER.

Photo. Them Wrong Way Up.

Can you not publish photographs of "The Owl" and "J.E.B." to enable us to have a look at them? May I suggest if they were both taken wrong-way-up they would look a treat, especially with their caps right-way-round, goggles included!

WRONG WAY ROUNDER.

Arundel.

Converting a Swivelling Lamn.

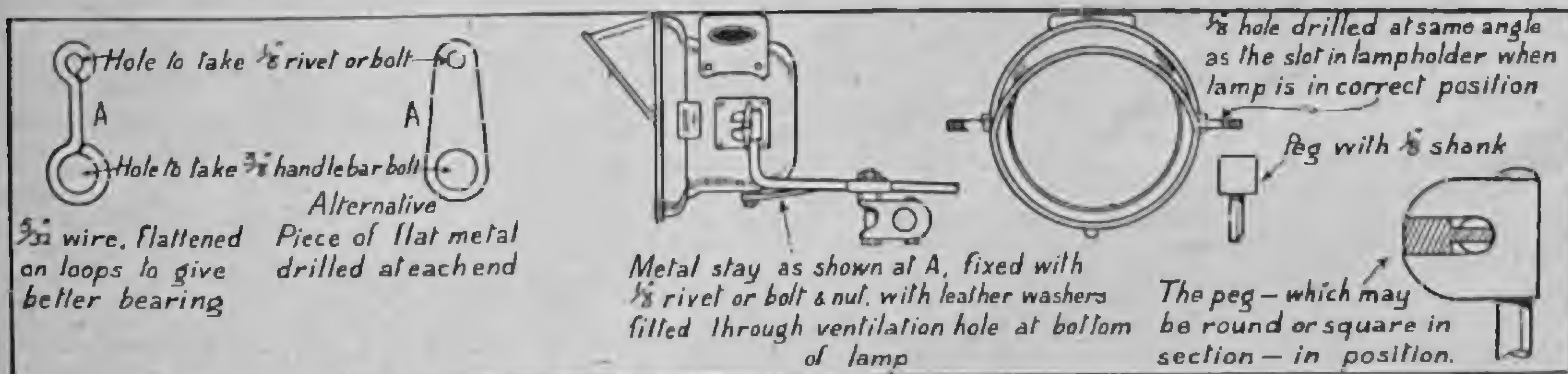
The following particulars of a method by which I have converted my Lucas lamp into a "non-swiveller" may be of interest. I think it differs a little from the methods which you have published previously.

First I have attached an extra stay which is fixed at one end over the handlebar security bolt, and at the other end is attached to the lamp (utilizing one of the ventilation holes) by means of a $\frac{1}{8}$ in. rivet or bolt and nut with leather washers to prevent injury to the lamp. The stay may be made from a piece of 5-32 in. steel, brass, or nickel wire looped at one end to fit the $\frac{3}{8}$ in. handlebar bolt, and at the other to fit the $\frac{1}{8}$ in. rivet or bolt, or it may be made from a piece of flat metal drilled at each end. As this extra stay might not

alone quite meet the legal requirements (it might be argued that it could be easily removed), I have further fitted a peg through one of the lugs to fit into the slot of the lamp holder. This is easily done by drilling $\frac{1}{8}$ in. hole through one of the lugs, care being taken to get the hole drilled at the correct position so as to give the desired angle for the lamp. A round or square peg should then be made the same thickness as the lamp lug with a shank set down to be riveted into the $\frac{1}{8}$ in. hole in the lug. When this peg is fitted the lamp becomes quite "incapable of movement independent of the machine," and I think it should meet all legal requirements. The accompanying sketches will, I trust, make the fittings clear.

J.H.H.

Birmingham.



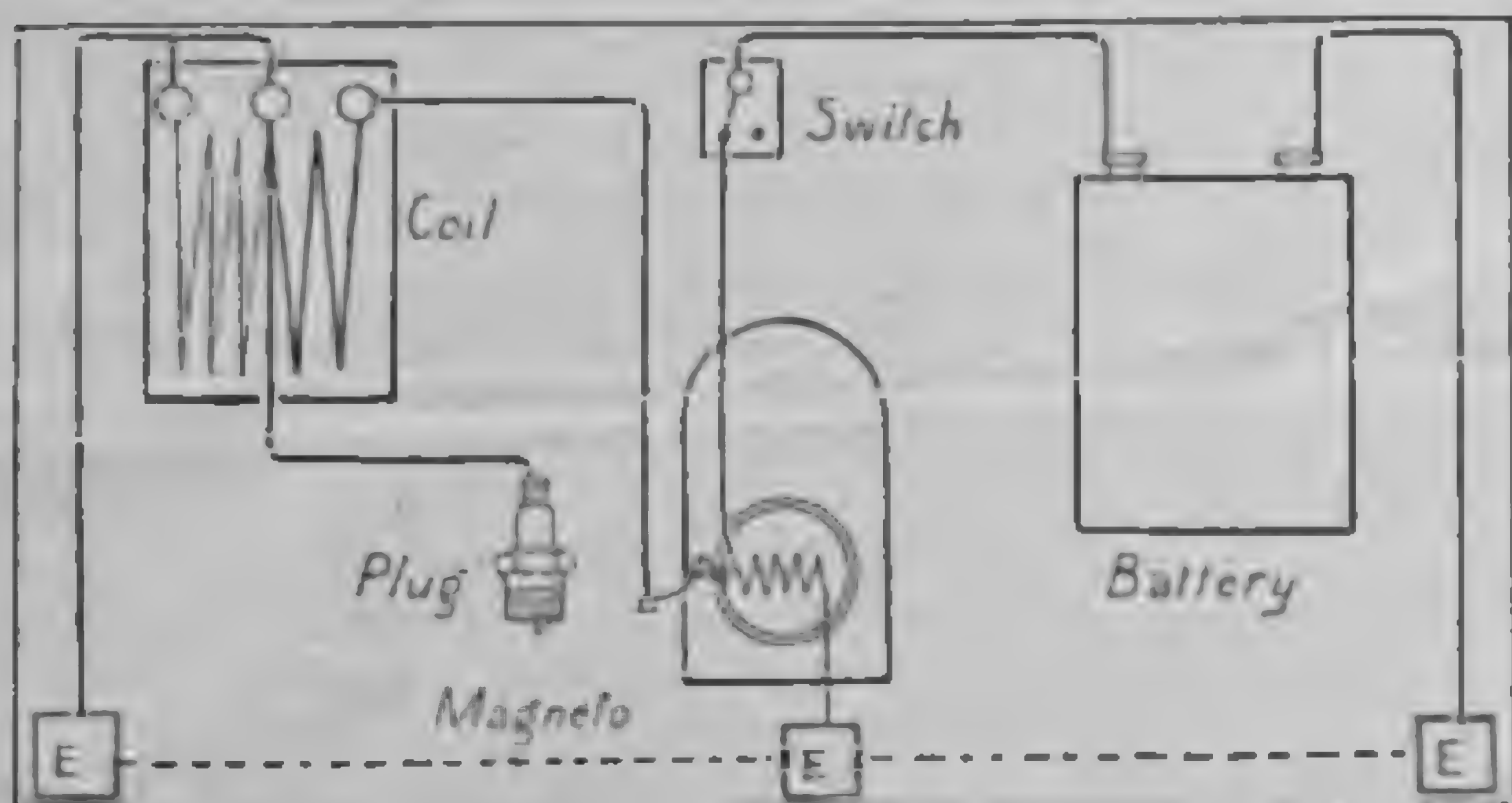
How a Lucas lamp was prevented from swivelling. See letter from "J.H.H."

Correspondence (contd.).

Low-tension Ignition Troubles.

Your correspondent "T.H.L." seems to have the same trouble as I once had. I had a good spark at the plug, but it was not "hot" enough for starting. I purchased a dry battery (Hellesen 4s. 6d. size) and wired it up through the existing coil, using the low-tension magneto for the make and break. I think the wiring was as per enclosed sketch. You will see there is a switch by means of which the current can be cut off from the battery. I found it was only necessary to use the battery current for the first 40 yds. or so after starting up from cold. When the engine was hot it would start without the battery current. The magneto had been overhauled by the makers at a cost of 25s., but still the engine would not start from cold with the magneto only.

While I am writing to you I thought I would tell you a little story. I had accumulator ignition with trembler on a 3½ h.p. "Sometimes went." I had just stopped and leaned the bike against a telegraph pole and was busy "diagnosing." I removed the cover from a box containing the accumulator and trembler coil to the evident interest of the usual crowd of small boys. Judge of my surprise when I heard one



Increasing the power of the spark from a low-tension magneto. See letter from E. Mitchell.

of the aforesaid small boys remark, when he heard the buzzing of the trembler coil, "Luk, Jimmie, 'e's telefonin' 'ome!" The "bike" must have heard the remark, for it condescended to take me home without any further trouble.

6, Saxon Street, Liverpool.

E. MITCHELL.

What Causes Engine Knocking?

I was surprised to see the old explanation again cropping up with regard to engine knocking. First of all, do we know that the "knock" occurs in the big-end, as stated? Also, does it "ruin the bush?" No doubt the engine labours very badly when it knocks, but what makes me doubt the usual explanation is my own practical experience.

I had a 3½ h.p. single, and when new it knocked more than half the time it was running, without overheating, or being timed too early, or from using too high a gear. When the bearings became worn, the knocking was less prominent, and after about 1000 miles was entirely absent. Surely this will disprove "F.G.B.'s" theory of worn bearings. Another point he might find of interest is that, even when that engine was thoroughly loose in big and little ends, and at its fastest turn of speed (63 m.p.h.), I could always make it knock by merely giving it too much oil, showing that the knocking was not due to lack of oil in the bearings.

C. W. TAYLOR.

Chesterfield Lodge, Oldhill Road, Torquay.

The Gibson Mon-Auto in America.

I note with interest your photo. and description of the Gibson Mon-Auto, and at the time, although not having heard of that machine here, I was interested enough to mention it to several of my friends. Since then, however, I have actually seen one on the road between New York and New Rochelle. I figure that it was making about 20 miles an hour along the level, and was ridden by a man who carried a small child in front of him as a passenger. It appeared to run very satisfactorily and smoothly. Whether this article is actually on the market or not, it is difficult to say, but undoubtedly it has been tried from a practical standpoint and appears to be a success.

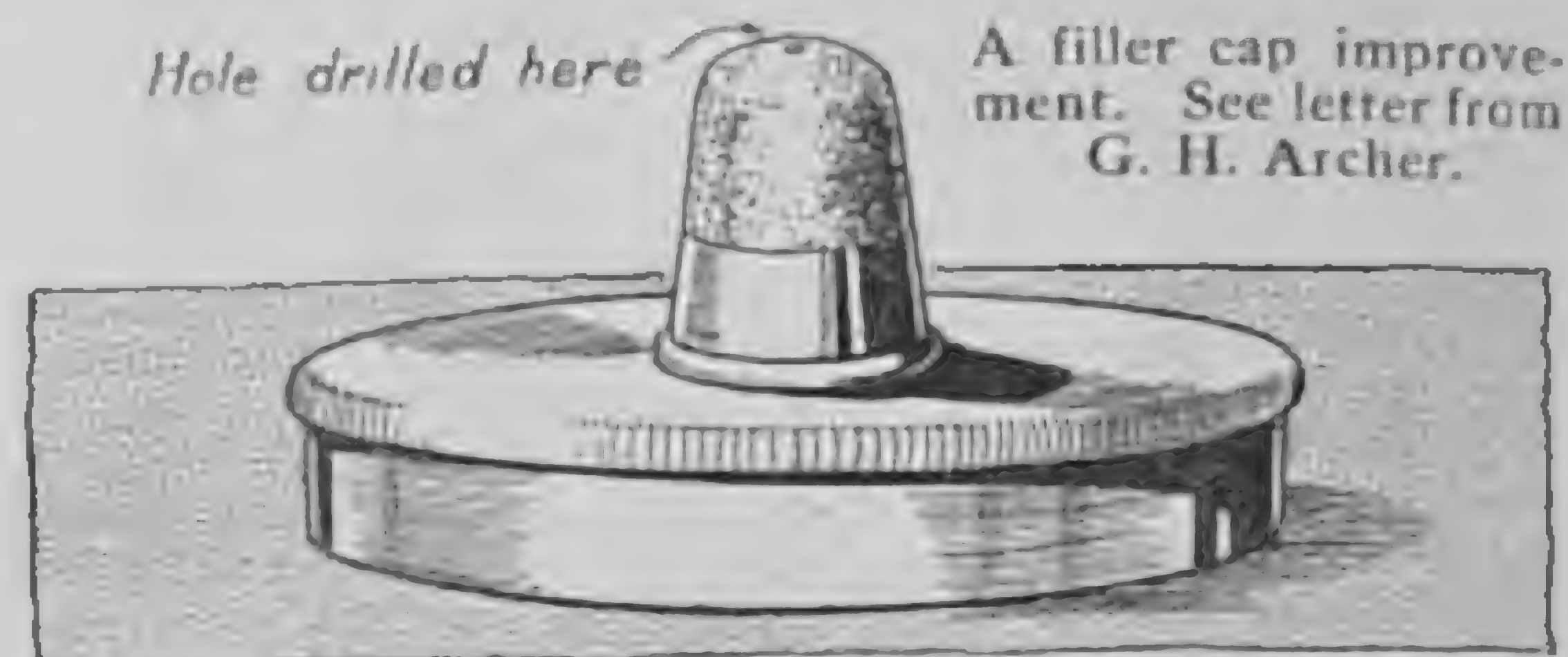
New York.

B28

F. MESINGER.

A Filler Cap Improvement.

As a constant reader of MOTOR CYCLING, I am always interested in the "Information and Advice" columns, from which I have picked up various "wrinkles." In the issue for 28th September, I noticed three methods of circumventing the splashing-over nuisance, each of which I consider inadequate for the following reasons respectively:—In Fig. 1 the suggestion is that a cycle lubricator helmet be soldered in position over the air hole in the filler cap. In my opinion,



this little contrivance, whilst keeping the petrol in, would keep the air out, and the spirit would, therefore, not flow into the carburettor as it is intended to do. Fig. 2 (the coiled copper tubing) seems to answer the purpose of admitting air and also of preventing overflow from the tank; but I am afraid that the operation of fitting such a delicate piece of tubing by soldering without filling the end of the tube with metal would be beyond the power of the average amateur motorcycle mechanic. The latter remark also applies to the third suggestion. In addition to this, I am inclined to think that the piece of tube would fill by capillary attraction and overflow from the end.

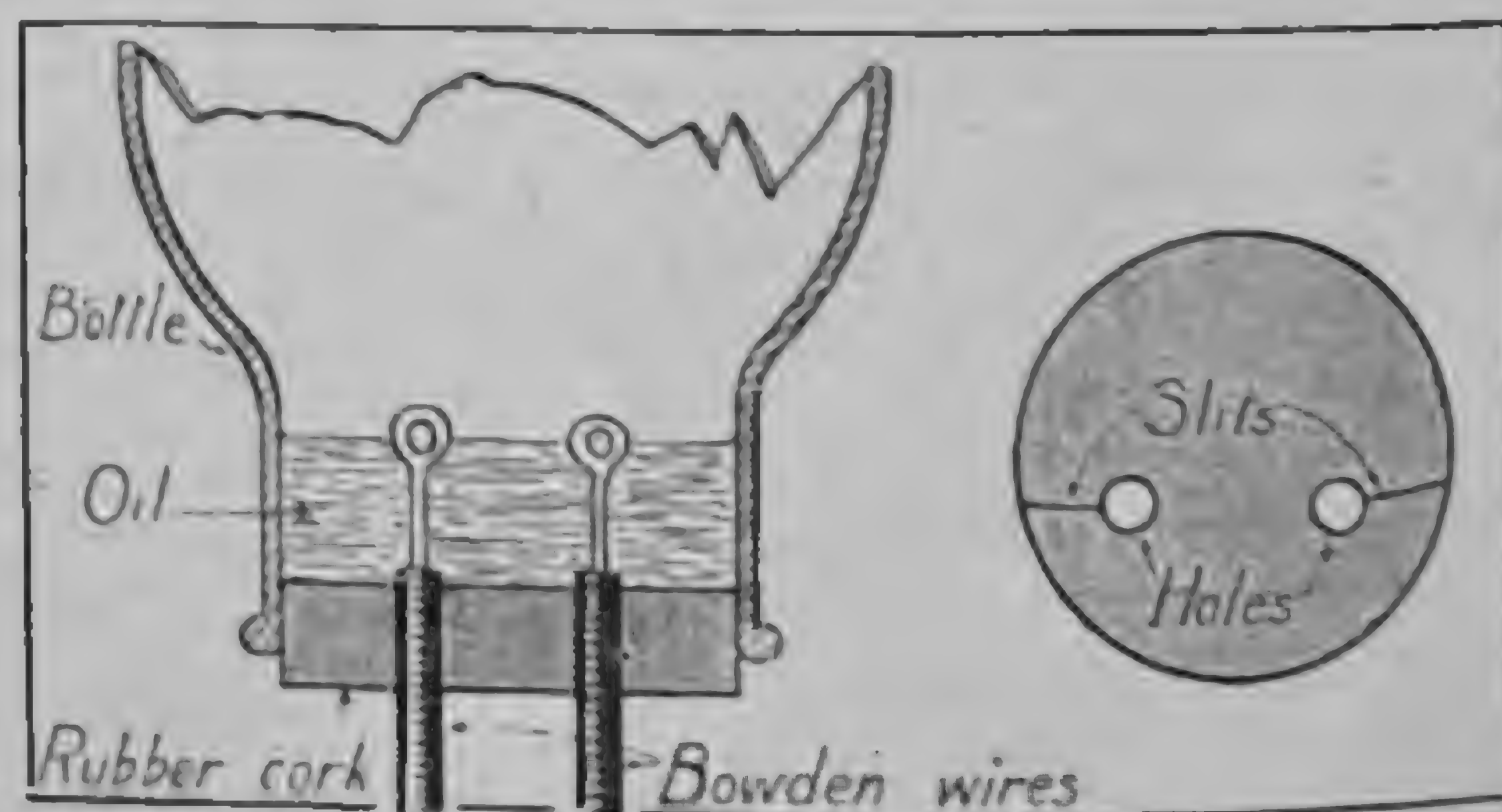
Here is a suggestion. I use an ordinary sewing thimble, with a hole drilled in the top, soldered down on to the filler cap in such a way as to leave a clear passage for air. The petrol may now splash up through the hole in the filler cap, but it will not come out over the thimble. On the contrary, it will return to the tank by the same passage as it left, since the overflow runs back down the walls of the thimble. This little introduction is not at all unsightly, and can be easily fitted by the merest amateur in a few minutes. Why is it that big manufacturers, who spend such a lot of time seeking improvements for their particular machines, should have left this important detail unconsidered?

GEO. H. ARCHER.

21, Eastlake Road, London, S.E.

A Tip for Oiling Bowden Wires.

A short time ago you mentioned a "tip" for oiling Bowden wires. The following may be of interest, and has been used by me with every success. The one essential is a large size "rubber" cork, commonly used in chemical laboratories,



A tip for oiling Bowden wires. See letter from T. J. Norman.

bored in two places the exact size of the Bowden sheath. A slit is cut from the edge of the cork to the holes. The wires can then be inserted in the cork, no matter how large a fitment may be attached to the end of the cable. The cork is inserted into a bottle neck, after the bottom of the bottle has been broken off. This is then inverted, and any oil poured in has no alternative but to run out via the wires.

Campbeltown, N.B.

T. J. NORMAN.

Correspondence (contd.).

"The Gipsy's" Mystery.**A Probable Explanation.**

With reference to the interesting "mystery" recorded by "The Gipsy" in *MOTOR CYCLING*, I had a similar experience recently whilst driving a 7.9 h.p. Indian. The symptoms were precisely the same as those experienced by "The Gipsy," namely, firing on one cylinder only. After checking all the usual sources of such trouble, I found the back inlet pipe union flange had become unbrazed, allowing the pipe, which is telescoped into the tube from the carburetter, to move slightly and permitting an air leak to the back cylinder.



Mrs. Dorothy Tanner and her 7.9 h.p. Indian.

After binding the damaged part with insulating tape the machine fired as well as ever: in fact, with the temporary repair I have driven the machine over 900 miles since. I thought the same thing might have occurred to "The Gipsy's" machine, and that after a time the inlet pipe may have shifted so as to stop the air leak, hence the machine would fire regularly again.

I send a photograph of myself and machine, which I have driven some thousands of miles without any trouble.

Catford.

Mrs. DOROTHY TANNER.

A Wind Theory.

"The Gipsy's" tale of woe is somewhat similar to my experience with a 1912 Douglas. I have been troubled with a persistent misfiring in the back cylinder for some weeks, and it is most noticeable when I am running slowly in a dead calm or with the wind behind. With a head or a diagonal wind the running is perfect. I have just finished a short tour of about 420 miles; for the first 340 miles the running was all right. I started the return journey with a fairly strong wind behind me and at the end of 16 miles stopped in a large town for petrol. On re-starting with the wind still behind, I could only get the front cylinder to fire, and ran downhill on this one cylinder for about half a mile trying all possible "mixtures" by means of the air throttle levers. At last, in desperation, I turned round uphill and against the wind, when the wretched thing started on both cylinders at once. I ran back into the town, then down the hill to my destination, 64 miles away, without another stop or a symptom of misfiring.

I have carefully examined the contact breaker, changed the sparking plugs and leads over, the valves are not sticking in any way, new valve springs have been fitted, the compression in the troublesome cylinder is absolutely perfect. I have examined induction and seating for possible air leaks, and have carefully taped up the joints. In case any correspondent suggests that there is an intermittent fault in the ignition circuit, I may say that I can get a terrific shock through my gloves if I touch the terminal of the back plug when I am plugging along on the front cylinder. The carburetter is a 1912 Amac, with a 26 jet, and has been back to the makers for

overhaul, but with no consequent improvement. I have tried a 27 jet, but the running is worse if anything, and the engine gets too hot on a long run with this jet. I have frequently noticed that, when running in a town, if I turn into a street where the air is quite calm or the wind behind, the misfiring will start, yet the moment I turn a corner and meet the wind the back cylinder chips in again. This seems to point to carburation trouble, yet why only the back cylinder?

Birmingham.

PUZZLED.

[Our explanation is that the mixture is too rich, which is counteracted by some imperceptible air leak in the front cylinder. We should try a smaller jet.—Ed.]

A Dangerous Road in Wales.

On reading about Second-Lieut. Maurice D. Basden's accident in *MOTOR CYCLING*, it struck me that the following communication from the R.A.C. might be of interest to you.

Lt. H. W. Ascott, R.N.

Dear Sir.—On the 23rd July you pointed out that the road from Flint to Prestatyn, in North Wales, had several bad potholes in it, and that these potholes were dangerous to machines with small clearance. We have been in communication with the authorities concerned, but it was only this morning that we received a letter from the Surveyor to the Holywell Rural District Council stating that the potholes on the road at Gronant are receiving attention.

J. W. ORDE, Secretary.

A fellow officer and myself observed, so long ago as last July, that the road might be very dangerous in the dark, and wrote about it at once.

I am sending the paragraph to the Secretary of the R.A.C.

H. W. ASCOTT, Lt., R.N.

68, Park Road, Birkenhead.

An Effective Costume.

I notice that you have recently devoted some little space to descriptions of suitable motoring garments for ladies. The photo. I send was taken at Edgehill on a recent Sunday, and shows quite the smartest costume I have yet encountered on



Mrs. Francis, of Banbury, who designed this very serviceable costume herself.

the road, at the same time being extremely neat and serviceable. Note the puttees. The lady is Mrs. Francis, of Parson Street, Banbury, who tells me that the design is her own.

High Street, Brackley, Northants.

ERNEST SMART.

Dr. Low and Female Casuistry.

I suppose it never occurred to Dr. Low that the girl who sat in the sidecar and pretended to help her companion by pushing the saddle of the attached machine was fooling, otherwise we might have been spared his remarks upon what he quaintly terms female "casuistry." Apparently a sense of humour is not one of Dr. Low's strong points. Hasn't the poor man any sisters to sharpen his wits?

Moseley.

A FEMALE.

Correspondence (contd.).

The Army and Navy Hill-climb.

A Nasty Suggestion and the Reply.

On the 23rd ult. a paragraph appeared in a contemporary of yours containing the following statement:—

"In contradistinction to the Army and Navy meetings held at Brooklands when practically every official was an Army or Navy man, not a single official announced for the Army and Navy hill climb on Saturday is attached to the services."

May I be allowed to state that this assertion is absolutely untrue. The officials comprised a number of men actually serving, and many others who are engaged on munition work or Government work of some kind.

F. L. BASSETT, 2nd Lieut. 1st R.W. Kent,
Chairman S.D.M.C.C.

Chief Marshal of the Army and Navy Hill-climb.

Writ Sarcastic.

For the 20th time I have just finished reading the letter in this week's MOTOR CYCLING from "Parson C.E.1711," re his 120-140 m.p.g. on a 5 h.p. Indian at speed. To say that I am interested is quite inadequate in expressing my feelings. I am fascinated, magnetized, absolutely paralysed at the contents. If it were not 10.30 p.m. I would rush to the nearest purveyor of Indians and buy up his stock.

Never did I imagine for one moment that any petrol-driven motorcycle would so nearly approach the m.p.g. performance of my 50 h.p. two-stroke (wild horses could not make me divulge its name). Perhaps "Parson C.E.1711" would be interested in reading the figures of one or two of the runs I have had on my fairly heavy two-stroke: at any rate here goes:—Berwick to Land's End at 57 m.p.h., petrol consumption 1 gallon and 2 dwt. On the return journey, by wearing my cap wrong way round, I was able to average 89½ m.p.h., with a petrol consumption of 3.32 of a gallon. Although these two runs were not by any means bad, they were entirely eclipsed by the tour I have just completed, viz.:—San Francisco, New York, Tipperary, London, upon which I started with petrol tank half full and finished up with the container overflowing. Upon telling a friend that I would not have believed it myself had I not the actual experience, he remarked, "Well, old man, I have not had the actual experience, so you will forgive me if I don't believe it."

F.H.P.

Hounslow, Middlesex.

In Favour of Pillion Riding.

I shall be much obliged if you will allow me just a few lines of your valuable space in which to air my views on pillion riding. Most of your correspondents on this vexed question appear to be strongly opposed to the practice, and I think someone ought in fairness to say a little in favour of what I personally consider to be an enjoyable and safe method of travelling for two. I have ridden many, many miles with a passenger behind, and on the only occasion when I did have an accident (absolutely unavoidable, though the circumstances are too long to narrate here), my passenger was most useful. The idea of one of your correspondents that it involves a great responsibility to have another's life in one's care, is really funny. What would he think if he were responsible for a car or a train load of passengers? Few, if any, of your contributors would hesitate before attaching a sidecar to any modern 3½ h.p. machine, nor do I think that, at a pinch, they would have many qualms about attaching a featherweight sidecar to a two or three-speed 2½ h.p. That then, disposes of any contention that the brakes, frame, etc., are not strong enough, and were not designed to bear the load of an extra passenger. Their chief objection is the "danger" of the practice. It must be admitted that there is always a slight element of danger in any form of motoring, and I maintain there is no more danger in pillion riding than ordinary solo or sidecar driving so long as (1) the driver uses ordinary care and discretion; (2) the passenger is not inclined to be wildly hysterical at the mere sight of an obstruction hundreds of yards ahead; and (3) the carrier is built sufficiently forward to bring the extra weight well in advance of the centre of the back wheel. This last I consider by far the most important point, for I think your readers cannot do other than agree that skidding is, to a very large extent, due to uneven weight distribution, and I feel also that this is a point which designers might bear in mind a little more than they appear to do.

The advantages of taking your passenger on the "flapper-bracket" instead of in a sidecar are many. The most im-

portant one, probably to many, is that the running costs are practically the same as for solo riding. Conversation, too, is easily possible, and without the throat-torturing efforts necessitated in many a modern sidecar outfit by the distance between driver and passenger. Pillion riding requires no expensive outlay like sidecarring, the only addition necessary being a cushion, although I personally prefer a large folded rug. In traffic, too, or in narrow lanes, a two-track outfit requires more careful driving than a single-track machine.

CORPL. 2352, 62nd Div., R.E.

Edwinstowe.

A Heavy Load.

The enclosed photograph is an interesting example of the work that is expected from the Rudge-Multi in Warwick (Australia). I took the snap one Sunday morning recently. The machine has done 30 m.p.h. with this load up.

Queensland, Australia.

J. SWANSTON.



An Australian reader says that this Rudge-Multi has done 30 m.p.h. with this load.

The Rudge-Multi Gear.

Some months ago I wrote expressing the highest appreciation of my T.T. Rudge-Multi. My reason for again intruding on your space is from a sense of justice towards this excellent machine which I have heard so often maligned by riders because of the multi gear being "rough on belts." I have found that if the gear lever is moved gradually and without jerking, a belt will last equally as long with this gear as when used over the ordinary pulley and belt rim, and, strange as it may seem, even better than a belt used with combined drive and running over a large countershaft pulley. I have a belt which I have used this year for 2000 miles on a 1915 countershaft machine. The sides of this belt are so thickly embedded with particles of flint thrown from the back wheel, that the belt is absolutely unfit for further use. With the multi gear there is provided a cover which effectually protects the pulley from dirt and wet. With experience of practically every machine and gear on the market, I am convinced that no solo mount is as near perfection or possesses so many excellent and clever points as the Rudge Multi, and scores of Army despatch riders have told me the same thing.

"EXTENTE."

London, E.C.

The Life of an Artificer.

I was rather amused at your reference to me in "Sidecar Topics" recently. "More bronzed and fitter than ever" made my friends smile some. An artificer seldom rides, and therefore does not get bronzed. He spends practically all his time in an open-air garage, or *artificery*, as it is popularly called, undoing the damage done by neglectful D.R.s.

It is not uncommon for us to dismantle a hub gear, wash all the parts, replace worn items, and have the machine going again before breakfast—about an hour's work. You would not catch us doing that in civil life! And our record for "taking an engine down," i.e., rebushing both ends of the connecting rod of a Triumph and reassembling, is about six hours. Doesn't that make civilians envious? In the piping times of peace the repairers would keep the machine for two or three weeks and charge at least 50s.

TOURIST.

INFORMATION & ADVICE.

Selected Questions and Replies.

In addition to giving advice, etc., as outlined at the foot of this page, we shall have great pleasure in forwarding to our readers, on receipt of two penny stamps, catalogues of motorcycles, which will materially assist in the choice of a machine. The type of machine required and the proposed outlay should be given in every case.

Benzole and Petrol.

A.R. writes:—Will benzole and petrol mix properly, or would one be used up before the other?

A.—Benzole and petrol mix perfectly, and the percentage of each in the last remaining part of a mixture would be approximately the same as at the time they were mixed.

Automatic Inlet Valve Trouble.

W.N.A. writes:—I have a 1912 2½ h.p. machine, the engine of which has an automatic inlet valve. My trouble is that it will not run slowly without misfiring. Even on bottom gear (10 or 11 to 1) it misfires below 10 m.p.h. When I open the throttle beyond about a quarter, it fires perfectly. The magneto gives a hot spark at all speeds. The carburetter is fitted with a jet numbered 30, but I think it is larger, for at 20 m.p.h. the engine runs perfectly on quarter throttle and full air.

A.—You should dismantle the inlet pipe and inspect the inlet valve. This may have become very oily, and should be thoroughly cleaned in petrol. You should then test the strength of the spring with the finger, and you should be able to lift the valve from its seating without undue force; about 5 oz. is correct. The cause of the misfiring is, in all probability, that at low engine speeds a sufficiency of the mixture is not drawn into the engine. With the throttle open and a greater suction exerted on the inlet valve, the trouble is overcome. With a weaker inlet valve spring you should fit a 27 jet.

Oversize Belts and Tyres.

S.Mc. writes:—My machine is of 2½ h.p. with a countershaft gear and chain-cum belt drive. I have fitted a 1 in. belt. This does not bed down properly in the countershaft pulley. Would it be best to obtain a new pulley? Owing to military traffic the roads are very much cut up, and I find that with the 2 in. tyres fitted the rims are easily dented. What is the best course to pursue in this case?

A.—The belt you have fitted to your machine is obviously too large. The proper belt to fit is a ¾ in. We should not advise you to fit a different pulley. Surely the countershaft pulley is adjustable, and can be opened to take the belt you have. If, however, it is not adjustable, we should advise you to obtain a ¾ in. belt. With regard to the tyres, you could obtain 2½ in. of any make; it would fit your rims. You must remember, however, that the mudguard clearance will be considerably lessened and in muddy weather the wheel might jam.

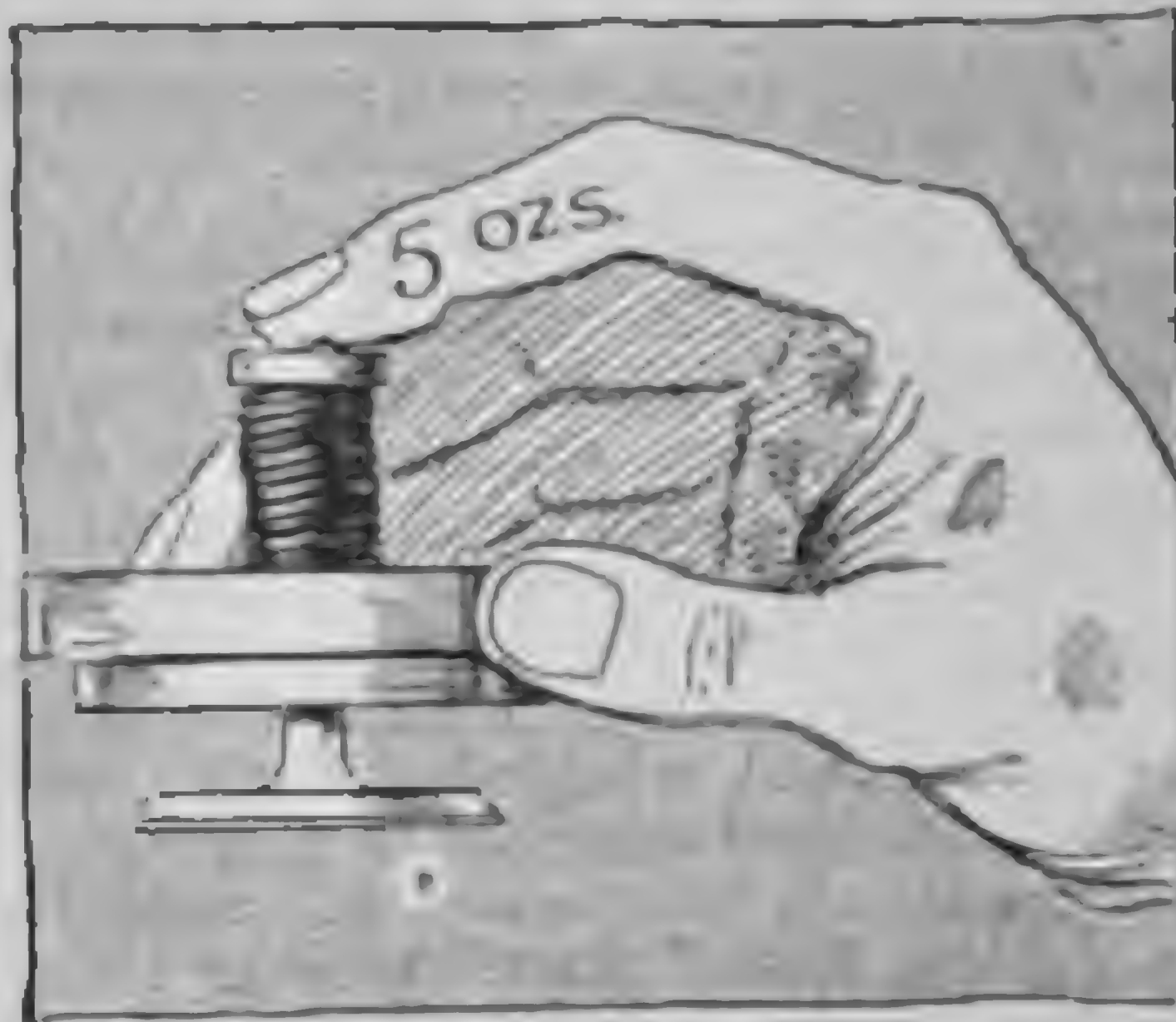
Coasting With Variable Gears.

D.D.B. writes:—Will it injure any part of my 2½ h.p. two-speed lightweight if, when descending a hill, I disengage the gears, coast down, and then engage the gear again when travelling fairly slowly, say at 10-15 m.p.h.?

A.—You are certainly making a mistake by engaging your gear with your engine stationary, and sooner or later you will wreck your gearbox or break the driving chain. If you desire to coast downhill in neutral it is absolutely necessary to stop at the foot, then let in the low gear and start off again. This, of course, only applies to gears of the dog-clutch type. With an Enfield gear, for instance, the exhaust lifter can be raised and the high gear gradually engaged.

Difficult Starting.

C.C.O. writes:—I should be glad of some hints so that the starting up of my 4½ h.p. single-cylinder is not so difficult



Testing the strength of an automatic inlet valve spring.

as at present, for I find it almost impossible to start up from cold. I use Vacuum B.B. oil—at what speed should the drip be in the lubricator?

A.—Carry out the following directions. Fully advance the magneto, open the throttle a very little indeed and close the air lever. You should not overflood. Now inject a little petrol into the compression tap and a kick-over compression should start up the engine immediately. The B.B. oil seems quite correct. You might, however, try T.T. in the colder weather. Incidentally, you should inspect the plug to see that it has not become oiled up; the points should be clean and quite close together. With regard to the lubrication of the engine, you should set the drip so that, whilst running, there is a fast drip, but not a continuous stream of oil.

Lamp Vibration.

M.R. writes:—I cannot stop my headlamp vibrating when travelling at over 12 m.p.h., yet when I lay my hand on it it stops instantly. All nuts and fixings are screwed up tightly.

A.—We cannot understand why your headlamp vibrates. Are you sure that you have a perfectly firm attachment to the handlebars? Lamp vibration, however, is sometimes caused by the engine being loose in the frame. You should see that all attachments are tight.

Worn Main Bearing.

A.J.P. writes:—On removing the cylinder of my 2½ h.p. four-stroke for carbon clearing purposes I noticed that when the driving sprocket was lifted the flywheels move up and down. What is the cause of this, and if a repair is necessary what should it cost?

A.—Obviously the main bearing pulley side is badly worn, and you should have this renewed at once. You will not be able to carry out the work yourself satisfactorily, so we should advise you to put the job in the hands of a competent repairer. Your best plan would be to get a definite estimate beforehand.

Serious Overheating.

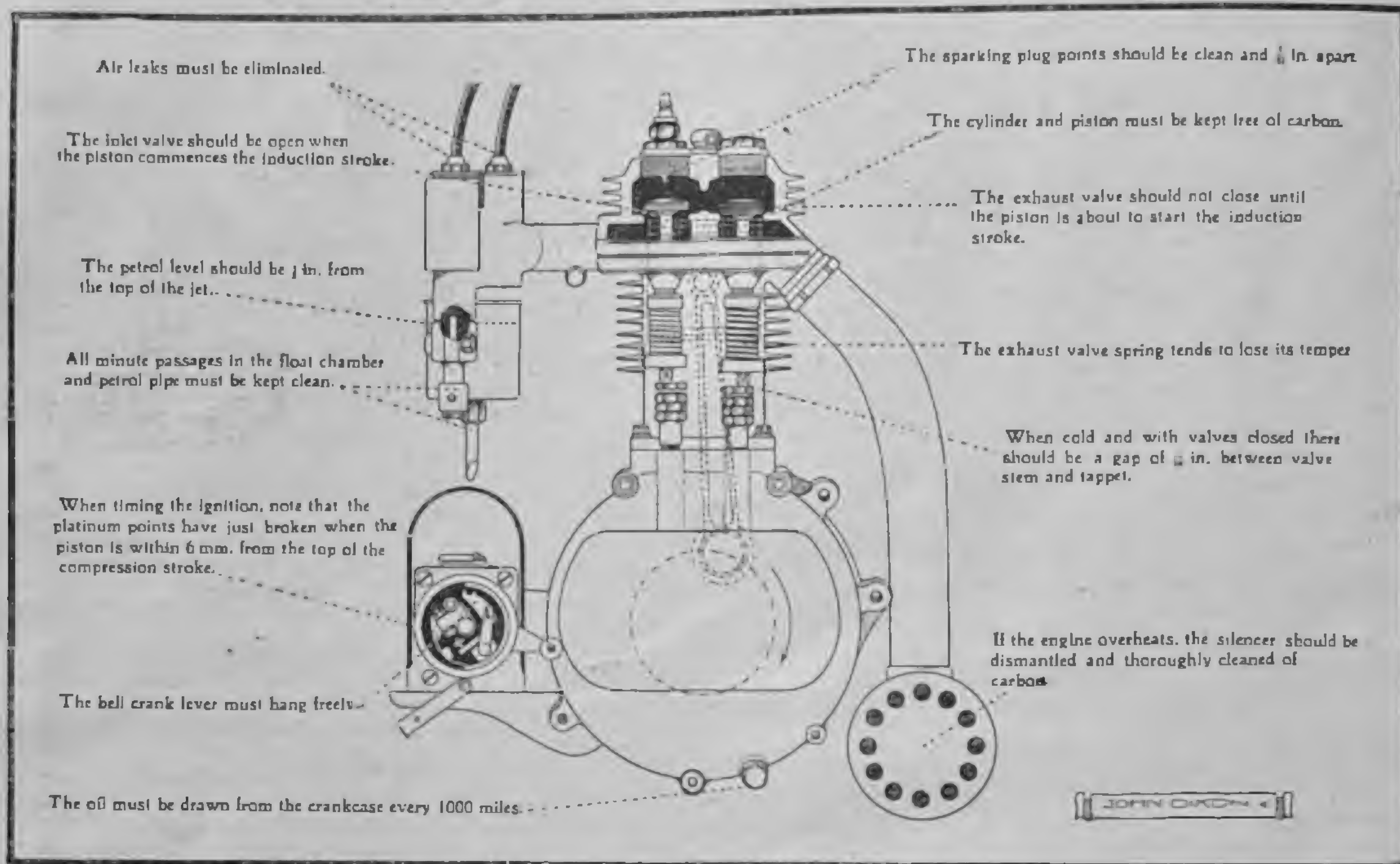
E.O'B. writes:—What is the cause of the top of the cylinder of my 3½ h.p. machine becoming red hot after but a mile's running. When this happens the engine stops, and I have to wait for it to cool down before proceeding. The petrol consumption is only 45 m.p.g.

A.—We should advise you to check the timing of the valves. The exhaust valve should close when the piston is about to start on the induction stroke, and the inlet valve should then start to lift. With the exhaust valve raised there should be a space the thickness of a visiting card between the inlet valve stem and tappet, and with the inlet valve raised there should be a similar clearance between the exhaust stem and tappet. The silencer should be examined in order to note that back pressure is not being set up through the exit holes being carboned up. The exhaust pipe, silencer and baffle plates must be thoroughly cleaned. The spark should take place with the ignition lever fully advanced when the piston is within 6 mm. from the top of the compression stroke. The spark takes place, of course, when the platinum points of the contact breaker have just broken. The jet should be about 27-30 in size and the petrol level should be within ¼ in. of the top of the jet. The operations are illustrated on the next page.

SPECIAL NOTICE.

RULES.—Owing to the growth of our Information Bureau we must insist on the following rules being adhered to: (1) All letters must be marked "I. and A." on the top left-hand corner and (2) a stamped and addressed envelope enclosed. Advice on the purchase of a machine and technical information of all kinds are given. Routes can be mapped out by a touring expert, and we have retained a lawyer with a special knowledge of motor cycling to answer legal queries.

A CHART FOR LOCATING TROUBLE.



A Three-passenger Problem.

W.J.H. writes:—I propose to buy a powerful sidecar combination, and I shall take my wife and two children as passengers. With the particular sidecar that goes with this machine I find there will be room for one of the children. Where is the best place to fix up a seat for the second one?

A.—We should imagine that your best plan would be to fix up a basket seat on the carrier of the machine for your third passenger. You should take great care, however, to see that the child is securely strapped to this seat. The attachment made in cane can be obtained from the Service Co., High Holborn, London, W.C.

LEGAL REPLIES.

A Dispute With a Dealer.

W.C. got into communication with a dealer, who stated that he could dispose of "W.C.'s" passenger outfit, paying a deposit of £10. Instead of keeping the machine a week as agreed, it was not returned until after a month, considerably damaged. The machine was returned unsold, and the dealer demands a return of his deposit.

A.—On the facts submitted the person to whom the sale of your machine was entrusted only had the right to use it for the sole purpose of effecting a sale to a prospective purchaser. He apparently used the machine for his own purposes, and to such an extent that we are of opinion that a court would hold that he used it excessively and unreasonably and without exercising proper care. If the cost of the repairs consequent upon the misuse of the motor exceeds £10 we advise you to refuse to return any part of the deposit and to defend the proceedings.

B52

Proceeding Against a Soldier.

S.F. writes:—Recently I sustained an accident through a soldier on his motorcycle and sidecar smashing into my motorcycle and sidecar, which was badly damaged. The soldier was not on military duty, but was using his own machine for a pleasure jaunt. I therefore sued him for, and was awarded, £25 damages and £8 10s. legal expenses in connection with the action, but am now informed, to my dismay, that I cannot recover these sums, as it is not permissible to sue a soldier for debt.

A.—We gather that you have obtained judgment in some court against a soldier for £25 damages and £8 10s. legal expenses. You say that you are advised that it is not permissible to sue a soldier for debt, although you also tell us that you have actually sued and been awarded damages and costs. Perhaps the advice you have received has reference to the protection afforded to soldiers under the Army Act 44 and 45 Vict. c. 58. The Army Act provides that a soldier of His Majesty's Forces shall not be liable to appear before the Court nor be liable to process of execution except:—

- (a) On account of a charge of or conviction for crime.
- (b) On account of any debt, damages, or sum of money when an amount exceeds £30.

There are certain formalities to be complied with before proceedings can be taken even in the case of these exceptions. As, however, you have got your judgment there seems to be no legal bar to your proceeding under the judgment, but you will require first to carry out the requirements of the Army Act, 1881, and, secondly, to obtain leave to proceed under the Courts Emergency Powers Act,

1914, and any order for enforcing your judgment will, without doubt, only be made against the soldier's property and not against his person. If, however, you have solicitors acting for you they should be able to do what is necessary.

A Collision Case.

T.S.B. was riding his motorcycle at a speed of 10 m.p.h. down a main road. A sidecar outfit drove out of a side street and knocked him off, causing various damages. Has he a claim?

A.—On the facts submitted by him we are certainly of the opinion that he has a good right of action against the owner of the motorcycle and sidecar, as it would appear that the accident was due to the other man's negligence. If he refuses to pay on application for the cost of the repairs and damages for the injury sustained, we advise "T.S.B." to consult a local solicitor with the object of commencing legal proceedings against him.

Exceeding Instructions.

Paisley writes:—In October last I took my motorcycle to a garage for repairs: it was leaking oil. They told me it would require a new half crankcase, as the one-half was cracked. In addition to this, it would require new piston rings, gudgeon pins and big-end bush, giving me an estimate, but only verbally, for between £4 and £5. After seven months I receive a bill for £8 12s., and they still hold the machine, which they state is not quite completed. I find they have fitted a new whole crankcase without consulting me, when only half was necessary. Am I bound to pay the charge of £8 12s.?

A.—You are only liable for such work and repairs as have been carried out in accordance with your instructions.

Nearly . . . 90 M.P.H.!

American Excelsior Breaks World's Record

On 12th September last, Carl Goudy, riding a 7-9 h.p. Excelsior (which we illustrated and described in our issue of the 14th ult.), has broken the 300-mile record in a sensational manner. Goudy covered the distance in 3 hrs. 29 mins. 51 secs., which works out at an average speed of over 85 m.p.h.

"Motor Cycling."

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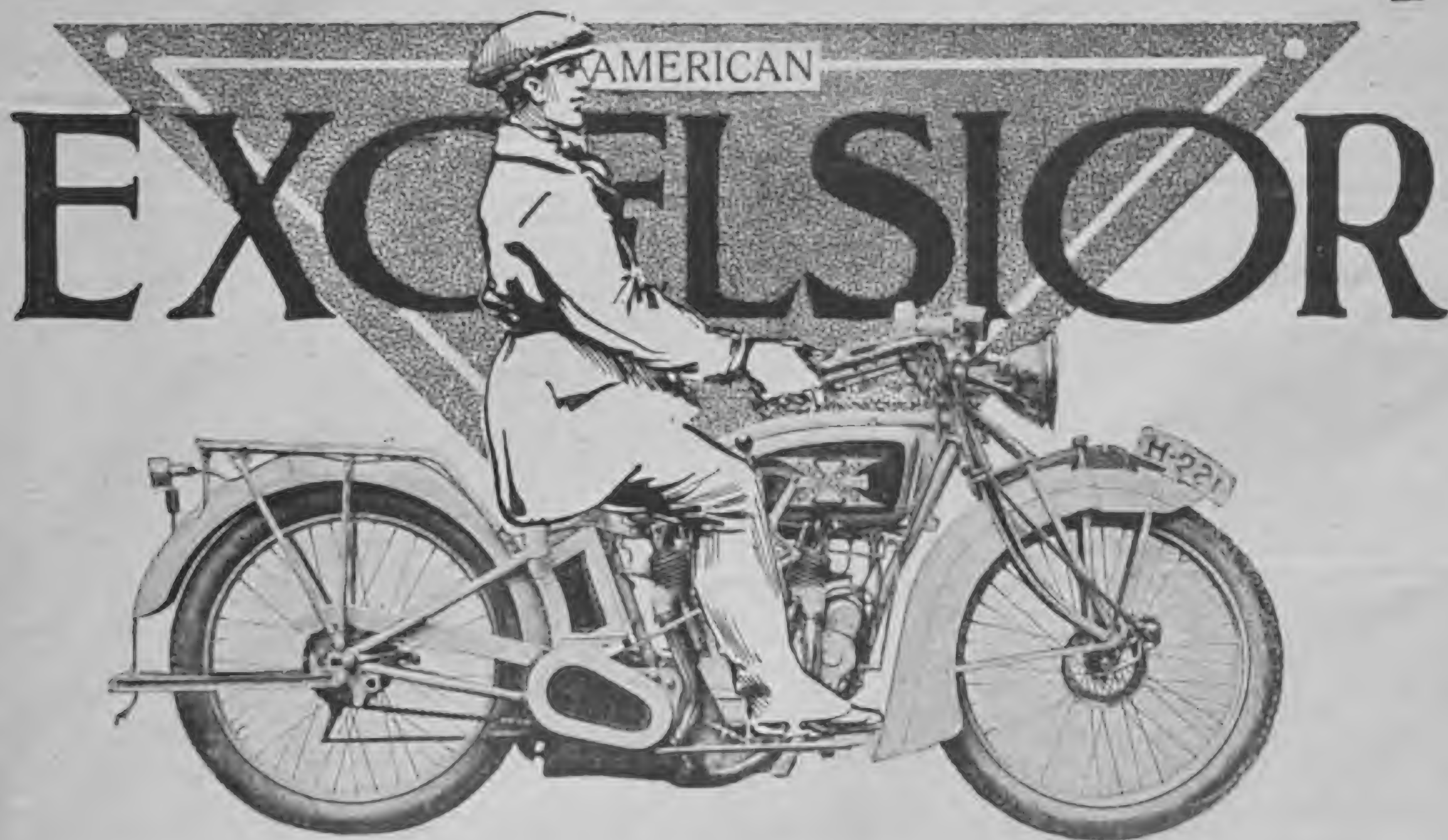
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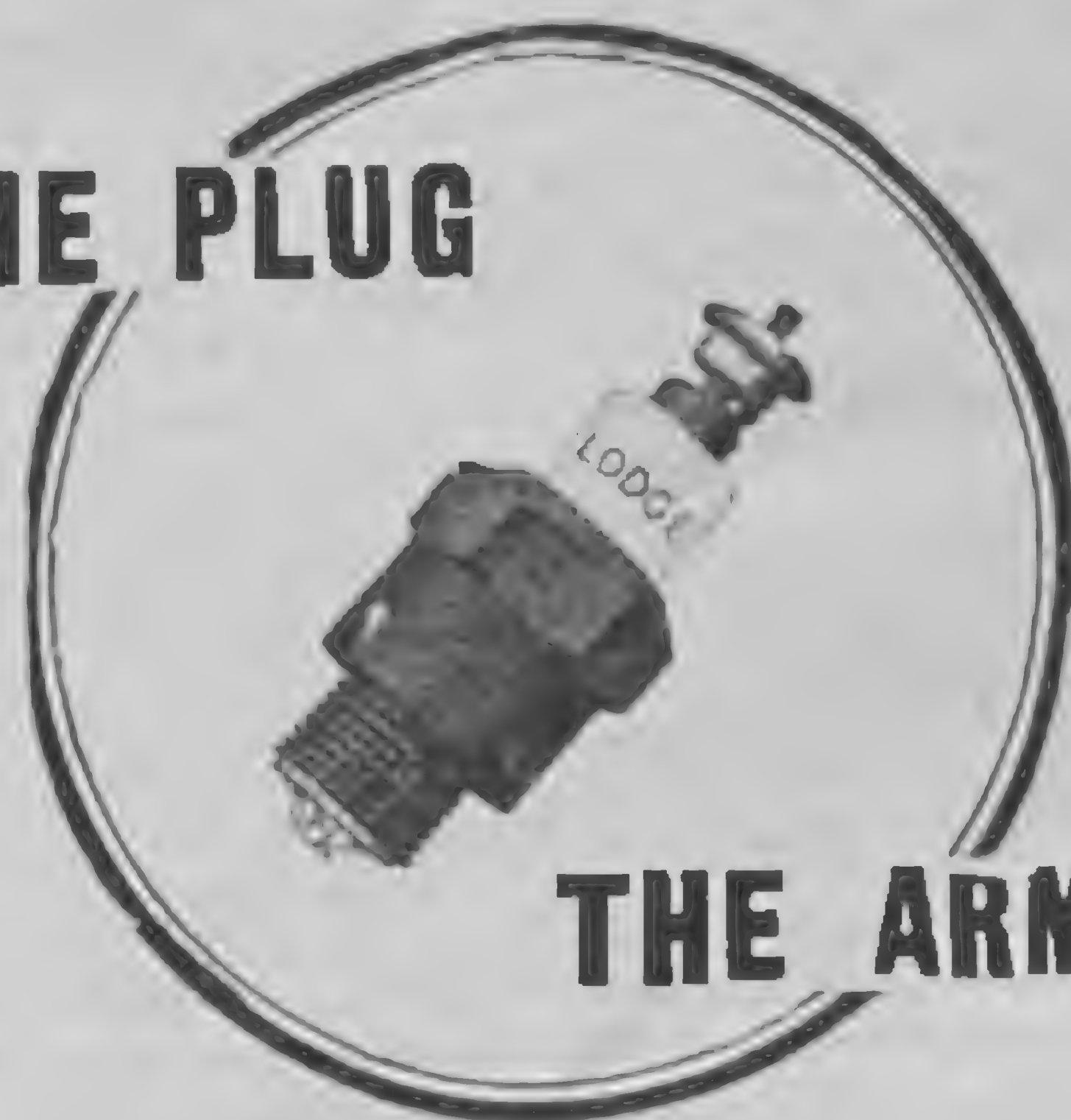
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MOTOR-BICYCLES.

—ABINGDON. 1913, 3½, suitable for sidecar, two-speed, spare belt and tube, price £27. Hedley, 610 High Road, Chiswick. 308-d44

—ABINGDON-KING DICK, 1914, 5½ h.p., Bosch magneto, perfect condition, all accessories, fast, reliable, £35. Bolton, Fort Borstal, Rochester. 309-c837

—A.J.S., 1914, 2½, two-speed, £38, offers, approval. Severn, High Street, Alfreton. 308-c844

—A.J.S., 1913, with handsome Canoelet sidecar, excellent condition, bargain, £65. The Barnes Motor Garage (opposite Red Lion), Barnes, S.W. 308-115

—A.J.S., prompt delivery of all models, 6 h.p., 4 h.p., and 2½ h.p. P. J. Evans, Birmingham and district agent, 87-91 John Bright Street. 308 94

—A.J.S., August, 1914, 6 h.p. combination, screen, lamps, Watford speedometer, spare valve, links, etc., mileage 2800, perfect condition, £75. Strange, Market Street, Oxford. 308-d102

—ALLDAYS ALLON, 1915, two-stroke, two speeds, nearly new, bargain, £35. 119 King George Street, Greenwich. 308-d69

—ALLDAY'S Allon, in stock, £31 10s., or £8 11s. 6d. down and 12 payments £2 0s. 10d., liberal discount if cleared in three, six, or nine instalments; two-speed also in stock at pro rata. Lamb's, 151 High Street, Walthamstow; Depot, 50 High Road, Wood Green. 151-c813

—ALLONS (Alldays two-stroke), the machine with so many features, single and two speeds from stock. Colmore Depot, 31 Colmore Road, Birmingham. zzz-154

—ALLON, £39, new, two-speed, two-stroke, all lamps, spares and tools, cost £42. 1 Montserrat Road, Putney. 308-c926

—ALLON, 1915, two-stroke, almost new and complete, £35. Barnes Motor Garage (opposite Red Lion), Barnes, S.W. 308-119

—ARIEL, 5-6 combination, in stock, £90 16s., or £23 16s. 6d. down and twelve payments £5 19s. 2d., liberal discounts for quicker payments. Lamb's, 151 High Street, Walthamstow; depot, 50 High Road, Wood Green. 151-c812

—ARIEL, 7 h.p., 1913, two-speed, coachbuilt sidecar with screen, in good order and condition, £40 or offer. Sale on behalf of private owner by the Greystones Motor Co., Co. Wicklow. 308-c881

—AUTO-WHEEL, Wall, attached New Hudson cycle, in good going order, a bargain, £7 10s.; call Saturday or Sunday. Russell, 25 Mountgrove Road, Blackstock Road, Finsbury Park. 308-c804

—AUTO-WHEEL, 1914, little used, unpunctured, overhauled, perfect, wonderful power, £9 10s. lowest, appointment. 4 Gaywood Road, Walthamstow. 308-c838

—AUTO-WHEEL, 1914½, with new Components cycle, complete, scarcely used, £12 10s. 57 Freegrove Road, Holloway, N. 308-c859

—AUTO-WHEEL, attached lady-back tandem, good condition, £14 or best offer; by appointment. 25 Isis Street, Earlsfield. 308-c917

—AUTO-WHEEL, cost 19 guineas, two-speed and free wheel, ridden 2050 miles, new tyre and tube 1820th mile, for sale, 9 guineas; also Raleigh bicycle, three-speed, cost 11 guineas, for sale, 6 guineas. J. Dover, Totland Bay, Isle of Wight. 308-d115

—AUTO-WHEEL, B.S.A., cost 18 guineas, done about 2 miles, splendid climber, sell 9 guineas, no offers; may be seen at Birmingham. Write, Faulkner, 469 Foleshill Road, Coventry. 308-d112

—AUTO-WHEEL, just overhauled, new tyre, perfect, £8. Gifford, "Chilterns," Halton, Tring. 308-c885

—BAT, 3½, two-speed, spring frame, with Service £10 sidecar, bargain, £23. 307 Sydenham Road, Sydenham. 308-c895

—BAT, free engine, 4 h.p., Stevens, fast and in good order, with sidecar, £12, or exchange for lightweight. Johnson, 24 Portmill Lane, Hitchin. 308-d84

—BAT-J.A.P., 1914, 6 h.p., bottom bracket three-speed chain drive (new), 1915 coach sidecar, all French grey, carefully used by expert, semi-T.T. bars, very smart, fast outfit, tools, spares, £65. Liddell, 20 Denning Road, Hampstead. 308-c843

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—BAT-J.A.P. 1913 combination, two speeds, f.e., kick-start, £42 10s., or exchange. 2 Trewint Street, Earlsfield, S.W. 308-d117

—BRADBURY, 1912, 3½ h.p., two-speed wicker sidecar, £37 10s.; cash or easy terms. R. E. Jones (Garages), Ltd., Swansea. zzz-686

—BRADBURY, 1913, 3½, two-speed, free engine, wicker sidecar, £32. Gerard, 20 Alexandra Villas, Finsbury Park. 308-c912

—BRADBURY, 3½, h.b.c., f.e., speedometer, Lucas lamp, new tyres and belt, plating, enamelling, excellent condition, £25; apply after six. Josland, 23 Wingham Grove, Clapham Common, S.W. 308-c893

—BRADBURY, 1911, single speed, T.T. bars, 20 guineas. Lamb's, 151 High Street, Walthamstow; depot, 50 High Road, Wood Green. 151-c819

EASTERN GARAGE



—BRADBURY, 4 h.p., 1915½, three-speed countershaft, chain drive, absolutely as new, mileage 300. £55. Jones, Dairy, Gray Street, near Selfridge. 308-d118

—BRADBURY, 1914, 6 h.p., three-speed, coachbuilt sidecar combination, £55. The Premier Motor Co., Aston Road, Birmingham. 308-72

—BRADBURY, 1913, and sidecar, two-speed, very sporty, perfect condition, just overhauled. £37. 16 Osten Mews, Emperor's Gate, Kensington. 308-d21

—BROWN, 2½ h.p., two-stroke, 1915, three months old. Amac, Dixie, overhauled fortnight ago, owner leaving for Front, 20 guineas or offers, cost £29. Pte. Treeby, Firwood, Frant Road, Tunbridge Wells. 308-c787

—BROWN motorcycle, with sidecar, 3½, new Dunlop belt, £10. seen any time. Rice, Thornhill, North Weald, Essex. 308-c851

—B.S.A., 1915, 4½ h.p., chain drive, with Canoelet sidecar, windscreen, lamp, horn, rear light, tools, etc., perfect combination, as new, done 100 miles, £62 10s. Apply, 2 McDowall Road, Camberwell Green, S.E. 308-c984

—B.S.A., 1913½, 3½ h.p., two-speed, free engine, chain drive, kick start, excellent order, lamp, tools, horn, with coachbuilt sidecar, £45. King, 5 Downs Park East, Bristol. 308-c978

—B.S.A., 1914-15, 4½ h.p., chain-cum-belt, three speed, and Speedwell sidecar, three new tyres and tubes, speedometer, horn, three lamps, etc.; spare belt, cover, tubes, whole outfit recently overhauled and re-enamelled throughout, splendid condition, £60. Lex, 24 Stow Hill, Newport, Mon. 308-c900

—B.S.A., 1913, 3½ h.p., free engine, lamps front and rear, speedometer, and accessories, perfect, £30. 46 Buxton Road, Leytonstone. 308-c842

—B.S.A., 1916 model K, three speed, just arrived, liberal exchanges. Lamb's, 151 High Street, Walthamstow. 'Phone. 169 Walthamstow. 151-c806

—B.S.A., 4½, 1916, model H, in stock for immediate delivery. Baker's Garage, Tonbridge. 308-c939

—B.S.A., 1912, 3½ h.p., free engine, fine condition, comfortable, semi-T.T. bars, fast, for two-stroke or 5-6 h.p., or sell £27. Faulkner, Queen Anne Street, Stantonbury, Bucks. 308-d114

—B.S.A., model K, 4½ h.p., chain-cum-belt, £62, just arrived from works, immediate delivery. D. J. Shepherd and Co., Enfield Highway, London, N. 308-85

—B.S.A., 3½, late 1912, two-speed, free engine, new Dunlop tyre, lamp, spares, like new, cheap, £38. H. Follows, Frankley, Birmingham. 308-d4

—B.S.A., model K, 4½ h.p., three speeds, in stock. Newsome and Fletcher, Ealing. 308-d23

—CALTHORPE, 1915, two stroke, two-speed, just arrived from works, immediate delivery, £31 7s. Wilkins, Simpson and Co., 11 Hammersmith Road, London. 308-m18

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B.S.A.—Model 11, 4 h.p., 3-speed.
BROUGH.—3½ h.p. twin, three-speed, countershaft gear.

CALTHORPE.—Two-stroke, 2½ h.p., two-speed. 2½ h.p. J.A.P. Enfield, two speed.

ENFIELD.—Two-stroke, 2½ h.p., two-speed. Model 140, 3 h.p., two-speed. 6 h.p., coachbuilt combination.

INDIAN.—7 h.p., three-speed model and Indian de luxe Sidecar.

JAMES.—3½ h.p. twin, three-speed.

NEW IMPERIAL.—2½ h.p. Jap engine, two speed.

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TRIUMPH, 1918, 2½ h.p., clutch model. 27

TRIUMPH, 1914, 4 h.p., 2-speed. 46

CHATER-TRIUMPH, 1914, 2½ h.p., 3-speed, headlamp, horn, and Coachbuilt Sidecar. 30

HUMBER, 1914, 2½ h.p., 3-speed, Lucas lamp set, Lucas horn, Cowey speedometer, back lamp and Corvete Sidecar. 48

BRADBURY, 1912, 2½ h.p., 2-speed gear, headlamp, back lamp, horn, Cowey speedometer, and Montgomery Spring Frame Sidecar. 33

CHATER JAP, 1912, 2½ h.p., 2-speed and Chater Sidecar. 27

RUDGE-MULTI combination, 1913, 2½ h.p., coachbuilt, fitted with hood and screen. 46

INDIAN, 1914, 7 h.p., clutch model, speedometer, headlamp, and "Flying Middleton" Sidecar. 50

A.J.S., 1913, 2 h.p., 2-speed, countershaft gear, headlamp, horn, and rear lamp. 40

ROYAL ENFIELD, combination, 1914, 6 h.p., coachbuilt, headlamp, horn, speedometer, exhaust whistle. 45

ZENITH, 1912, 2 h.p., Gradua gear, headlamp, rear lamp, and horn. 38

ZENITH, 1918, 6 h.p., Gradua gear, clutch and kick starter, Lucas headlamp, rear lamp, horn, and Cowey speedometer, and fitted with Gloria sidecar. 52

P. & M., 1914, 2½ h.p., 2-speed model, Lucas headlamp, back lamp and horn. 46

AUTO WHEEL, 1910, 1 h.p., standard model. 9

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—CALTHORPE, 1915, 2½ h.p., two-speed, two-stroke, new, £32 10s. Nesma, 7 Exhibition Road, South Kensington. 308-c988

—CALTHORPE, 1915, J.A.P., Enfield two-speed, just arrived from works, immediate delivery, £36 15s. Wilkins, Simpson and Co., 11 Hammersmith Road, London. 308-m17

—CALTHORPE-J.A.P., two-speed, £36 15s.; two-stroke, two-speed, £31 7s.; two-stroke, single-speed, £27 14s.; generous deferred terms if desired. Lamb's, 151 High Street, Walthamstow; depot, 50 High Road, Wood Green. 151-c818

—CALTHORPE-J.A.P.s. Latest models in stock at Alexander's, 115 Lothian Road, Edinburgh. 308-105

—CALTHORPE JUNIOR, two-speed, in nearly new condition, £18 or near offer. Tuke and Bell, Ltd., Motor Department, Carlton Engineering Works, High Road, Tottenham. 308-67

—CALTHORPE-PRECISION, 4½, 1912, and sidecar, two speeds, f.e., just overhauled, splendid running order, all tyres new, horn, tools, etc., £28 cash, or exchange lightweight. Elgey, Canal Road, Bradford. 308-d6

—CAMPION-J.A.P., 6 h.p. twin, 1912 model, two speeds, free engine, bargain, £28; exchanges. Speechley, 45 Church Road, Acton. 308-c952

—CAMPION-PRECISION, late 1914, 4½, coachbuilt combination, countershaft, two-speed, f.e., kick-start, three electric lamps, perfectly new condition, not been 1200 miles, £54 or nearest. 25 Havelock Place, Hanley, Staffs. 308-d22

—CENTAUR, 2½, twin, Armstrong three-speed gear, in tip-top condition, £27 10s. Apply, care of Weeks, 66 High Street, Eton, Windsor. 308-c998

—CHATER LEA, 1914, 8 h.p., coachbuilt combination, special engine, three-speed countershaft, car bearings throughout, 700 by 80 Avons, nearly new, Amac, speedometer, Lucas guinea horn, three expensive gas lamps, several refinements, complete accessories, 60 m.p.g., cost £112, accept £65, any trial or examination Friday, Saturday or Sunday by appointment. 21 Western Lane, Nightingale Lane, S.W. 308-c783

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—CLEMENT, 1½ h.p., low, new wheels, tyres, tubes, £5 15s.; any evening. 602 King's Road, Fulham, S.W. 308-c924

—CLYNO two-stroke, 1914, two speeds, clutch, accessories, like new, £32. Auto Mart, 133 Hammersmith Road, W. 309-1987

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—CLYNO combination, 1913, equals new, £45 10s., exchange less power. 127 Howard Road, Walkley, Sheffield. 308-c949

—CLYNO, 1912, coach-built combination, two speeds, f.e., kick start, beautiful turnout, bargain, £35; exchanges. Speechley, 45 Church Road, Acton. 308-c953

—CLYNO, 1913 combination, three speeds, kick start, detachable wheels and spares, hood, screen, two lamps, price £45, lowest. Ramuz, 151 Leigh Road, Westcliff-on-Sea. 308-c946

—CLYNO, 2½ h.p., two-stroke, two-speed clutch model, very little used, exceptionally fast, best offer on £30 accepted. C. H., 21 Highbury Quadrant, London, N. Phone, North 1508. 308-124

—CLYNO, 1912, 6, two-speed combination, £36. 53 Brownhill Road, Catford. 308-d67

—CLYNO, 1914, two-stroke, good condition, £26. Lockington, Malden Road, Malden, Surrey. 308-d49

—CLYNO 1913, three-speed combination, quick sale, £45. Clapham, King George Street, Greenwich. 308-d18

—CONNAUGHT, two-stroke, 2½ 3 h.p., three speeds £30 5s. Officer, Brooklands, Crownhill, Plymouth. 309-c503

—CONNAUGHT Miniature, two-stroke, 2½, 25 guineas, shop-soiled. Williams, Chapel-ash Depot, Wolverhampton. 308-d5

—DALM, 2½, two-stroke, 1915½, Amac, E.I.C. variable ignition, Dunlops, low petrol consumption climb anything, done 650 miles, £25, seen 4 to 6, appointment preferred. Wootton, 20 Cloudesley Square, Barnsbury, N. 308-d111

—DE DION, 2½ h.p., low, spring forks. B. and B. carburetter, seen running any evening, £6 15s. 602 King's Road, Fulham, S.W. 308-c922

—DOUGLAS, all models. Goulay, the Great British Douglas Agent, Fallowfield, Manchester. 142-c381

—DOUGLAS, our speciality, probably we can supply; try us. Gibb Gough, The Douglas Specialists, Gloucester. 325-208

—DOUGLAS. All models from stock from sole wholesale and retail Midland agents, Colmore Depot, 31 Colmore Row, Birmingham. zzz-153

—DOUGLAS, immediate delivery all 2½ h.p. models. Moffat, Douglas Agent, Yeovil. Tel. 50. 352-h459

—DOUGLAS, 1913 T.T., new tyres, excellent condition, £35; also 1913 clutch model, £35. Care of Hannis, 47 Guildford Street, Chertsey. 308-c997

—DOUGLAS, 1913, accessories, including lamp, horn, rear light, footboards, very fast, owner enlisting. £26. Phillips, Loch View, Newport, Salop. 308-c982

—DOUGLAS 1913, 2½, splendid condition, £34. Jackson, 348 City Road, E.C. 308-c802



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Rex, 6 h.p., 1914, combn., 2-sp., n.w.	£19 0
James, 3½ h.p., twin, 3-sp., all-chain	86 6
Sun, V.T.S. engine, 2 speeds	37 9
James, 4½ h.p., 3 speed combination	80 0
Blackburne, 3½ h.p., 3-sp., counter-shaft gear, footboards	67 9
Royal Ruby, 2½ h.p., J.A.P., 2 speeds	39 10
Lea-Francois, 3½ h.p., 3 speeds	£72 19 6
Zenith, 8 h.p., clutch	£81 18
J.H., 6 h.p., 3 speeds, countershaft	73 10
B.S.A., 4½ h.p., 3 speeds and sidecar	75 11

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Sale Prices	Usual Prices
£33 B.S.A., 3½ h.p., 2-sp., cane sidecar	£41
50 Rex, 1914, 8 h.p., Spacke eng., 3 sp.	58
44 Rex, 1914, 6 h.p., hood and screen	50
73 Enfield, 1915, 6 h.p., all accessories	78
64 Zenith, 1914, 8 h.p., red. Montgomery 20 in. sidecar to match	68
71 Harley-Davidson, 1915, 3 speeds, Millford sidecar	74
50 Rex, 1914, 6 h.p., 3 sp., coach's car	55
47 Bat, 1913, 6 h.p., 3 sp., coach's car	53
53 Rex, 1914, coach car, 8 h.p., 2 sp.	58
60 Rex, 1914, 6 h.p., 2 sp., brand new	70
70 Indian, 1915, 5 h.p., 3 sp., Phoenix sidecar	75

SOLO MOUNTS.

£50 Indian, 1914, 7 h.p., dynamo model	£54
43 P. & M., 1913, 3½ h.p., 2 sp., all accessories	45
14 Humber, 1912, 2 h.p., lightweight	18
47 Brough, 3½ h.p., 1914, countershaft 2 speed	52
26 Torpedo, 2½ h.p., 1914, 2-stroke	24
26 D.K., 1915, 2½ h.p., 2 speeds, accessories	29
48 Triumph, 1914, 4 h.p., 3 speeds, T.T. bars	52
47 Triumph, 1914, 4 h.p., 3 speeds, standard	52
46 Brough, 1915, 3½ h.p., 3 speeds	54
18 F.N., 1912, 2½ h.p., 2 speeds, shaft drive	24
42 Rover, 1914, 3½ h.p., 3 speeds, T.T., as new	49
Rex, 3 h.p., good tyres, suit amateur	10
12 Douglas, 1910, 2½ h.p., just overhauled	18
23 Alldays Matchless, 3 h.p., 1914, 2 speed	26
42 Rudge, 1915, 3½ h.p., 1 of M. Multi	48
14 Rex, 1909, 3½ h.p., 2 speeds	20
4 Ariel, 2½ h.p., coil and accumulator	8

In view of the heavy reductions, 10% extra is charged for easy payments.

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G.W.K., 1914, just repainted like new	£130
Crescent, 1914, 8 h.p., shop-soiled, hood and screen	115
Warne, 1914, 8 h.p., 3 speeds, live axle, new	105
Victor, 1914, 8 h.p., 2 speeds and reverse, just repainted	60

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—DOUGLAS, 2½, 1913-14, T.T. model, two-speed, in perfect condition, new Hutchinson on back, new Pedley belt, good lamp and horn, fast, £35. P. Foxley, Loughton, Blechley, Bucks. 308-c915

—DOUGLAS, 1911, completely overhauled by makers, all accessories, £21. Silvester, 38 Bergholt Crescent, Stamford Hill. 308-c882

—DOUGLAS, 1915½, model W, three-speed, as new, not ridden 250, £52, or exchange 1914-15 T.T. Douglas and cash. E., 23 Market Place, Kingston, S.W. 308-c875

—DOUGLAS, 1911, recently overhauled, bargain, £18, no offers. 305 Broad Street, Birmingham. 308-c870

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—DOUGLAS, 2½ h.p., 1914, T.T., two speeds accessories, new tyres, £43. Auto Mart, 133 Hammersmith Road, W. 309-1986

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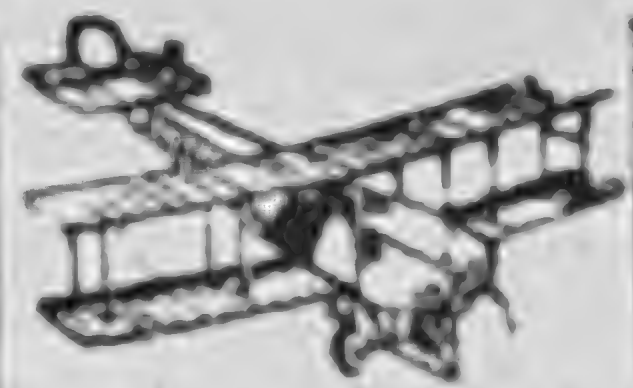
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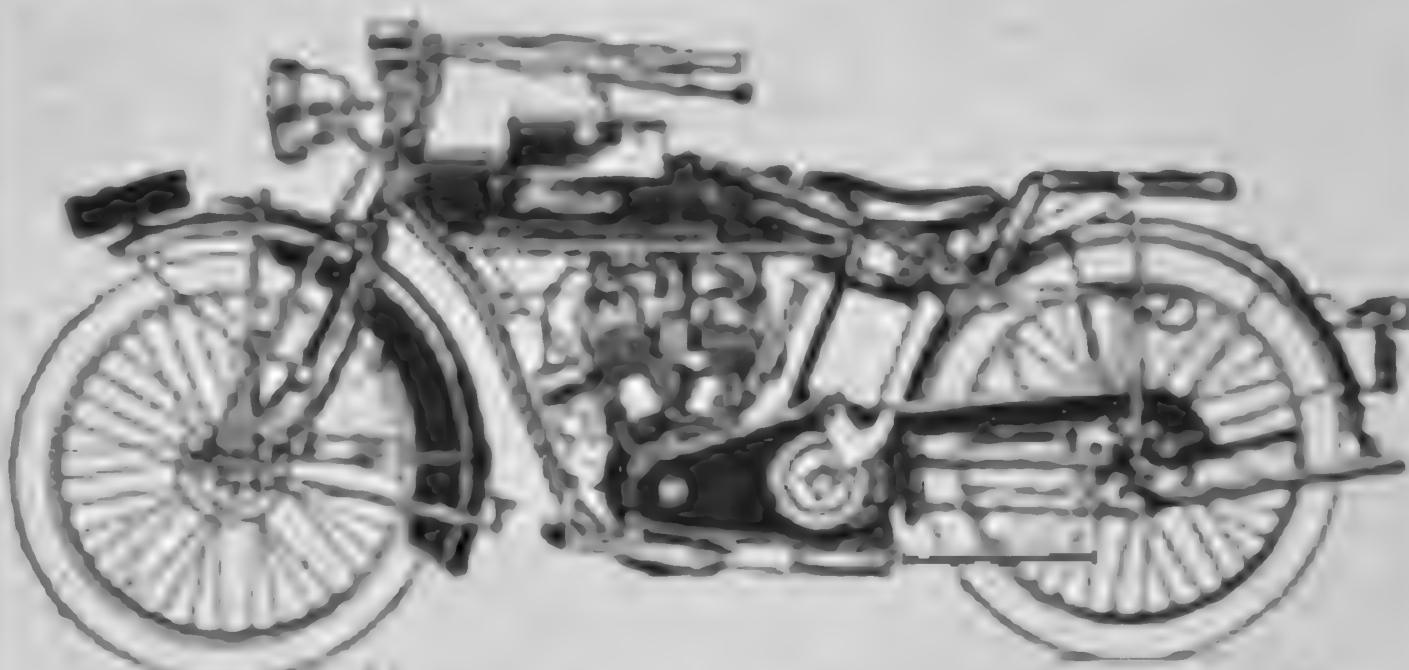
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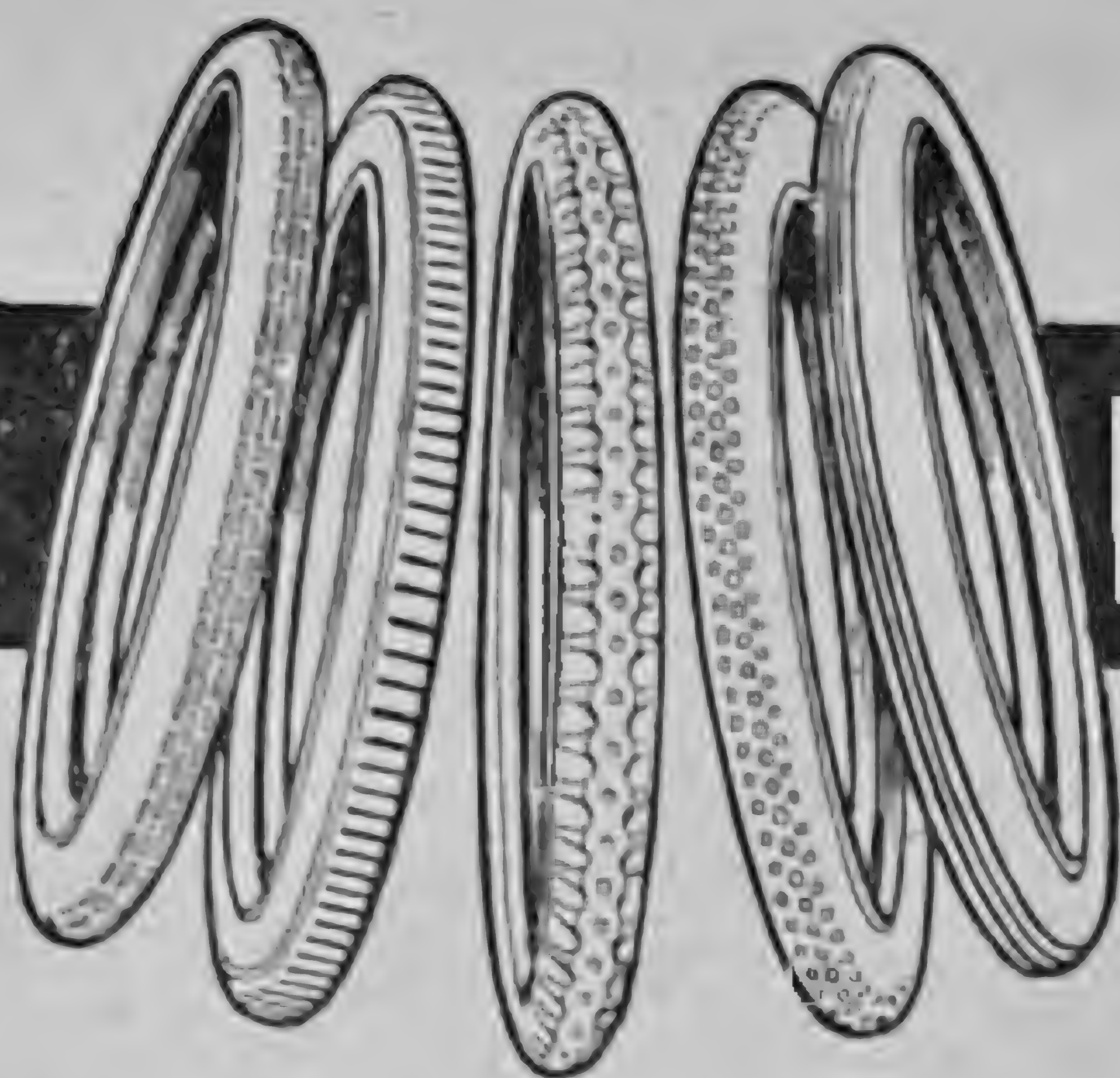
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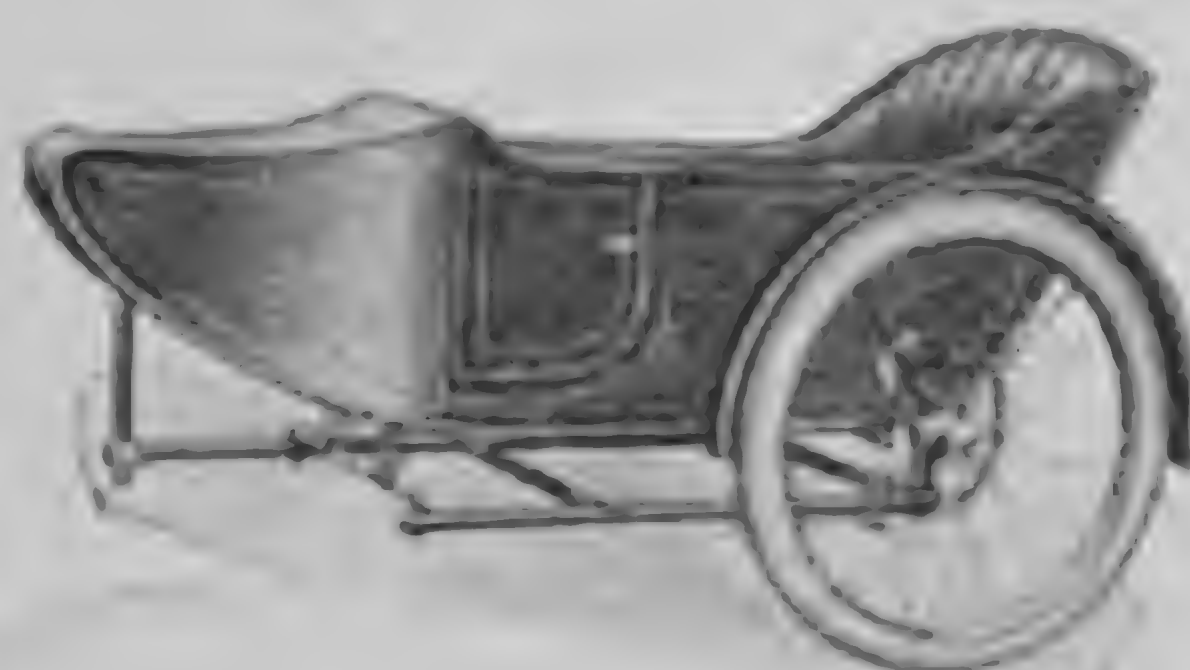
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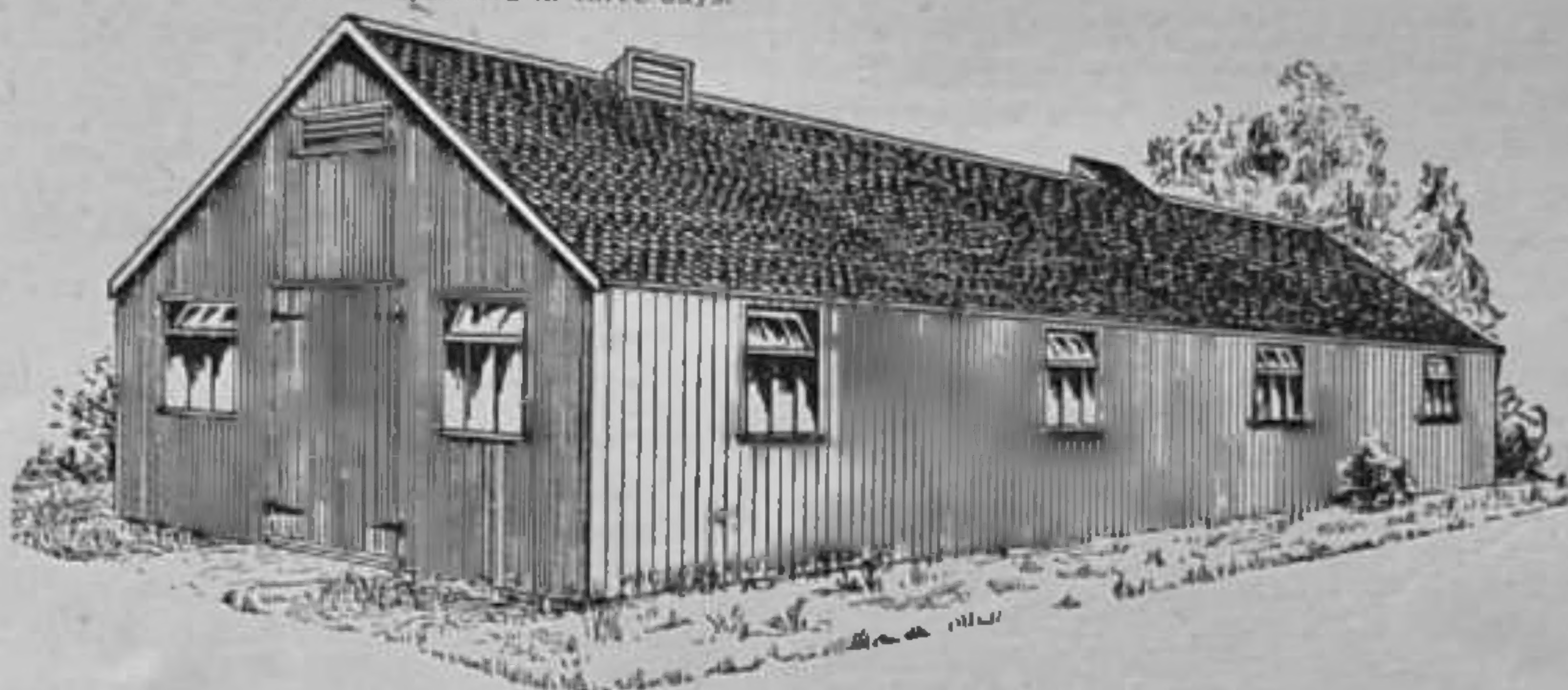
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45	15	7	12	45	90	20	8	14	120	90	30	8	16	180
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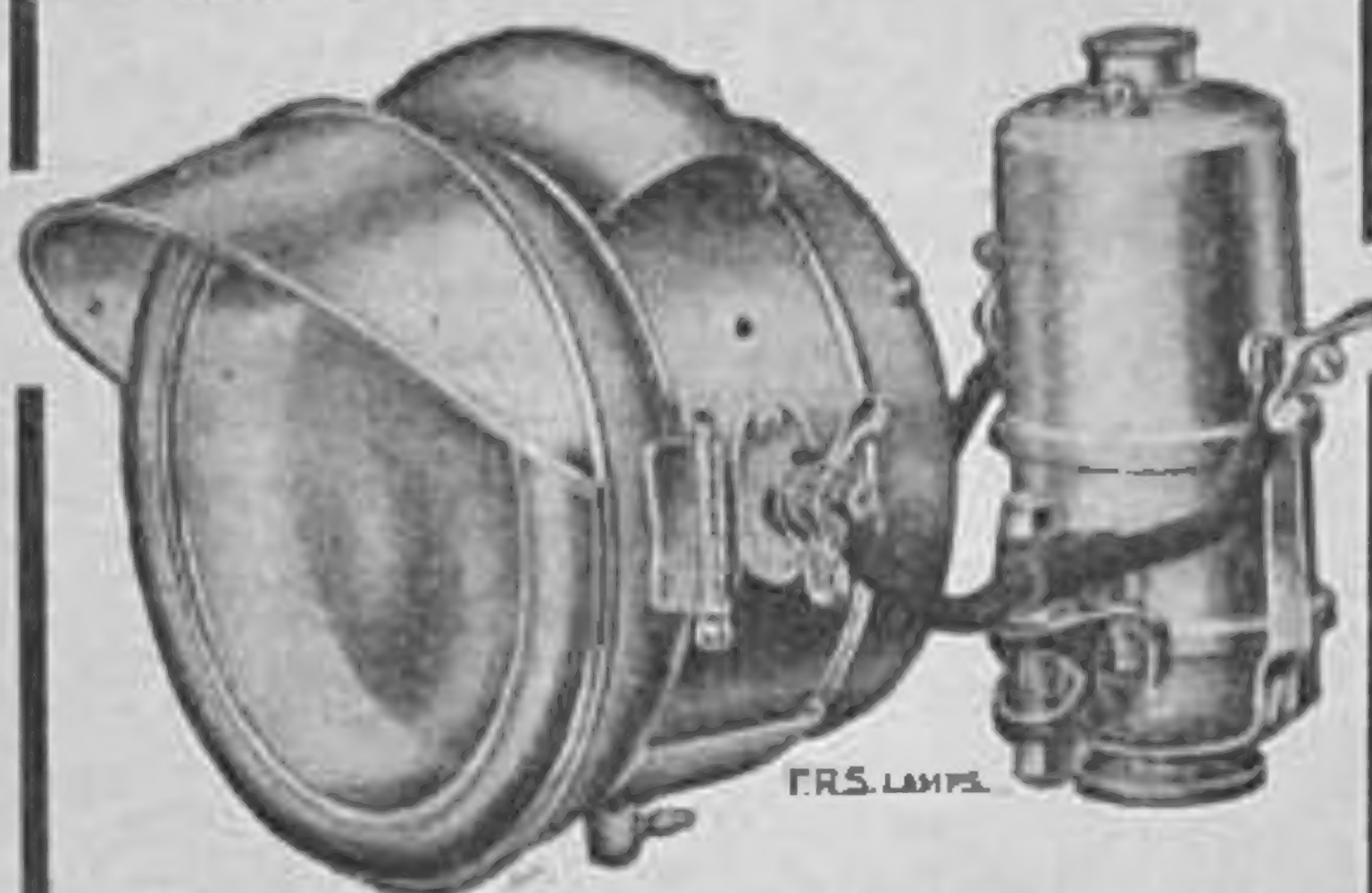
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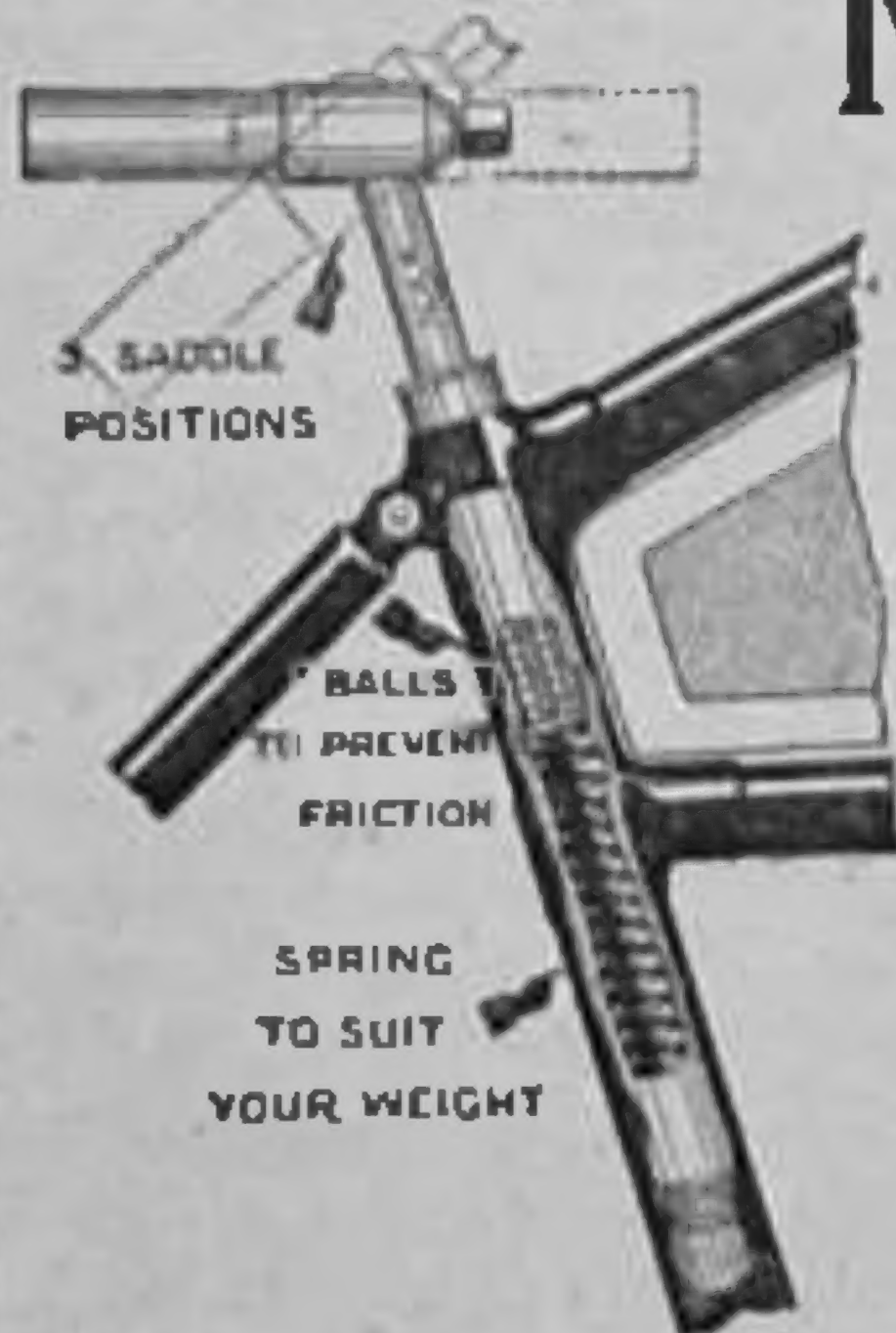
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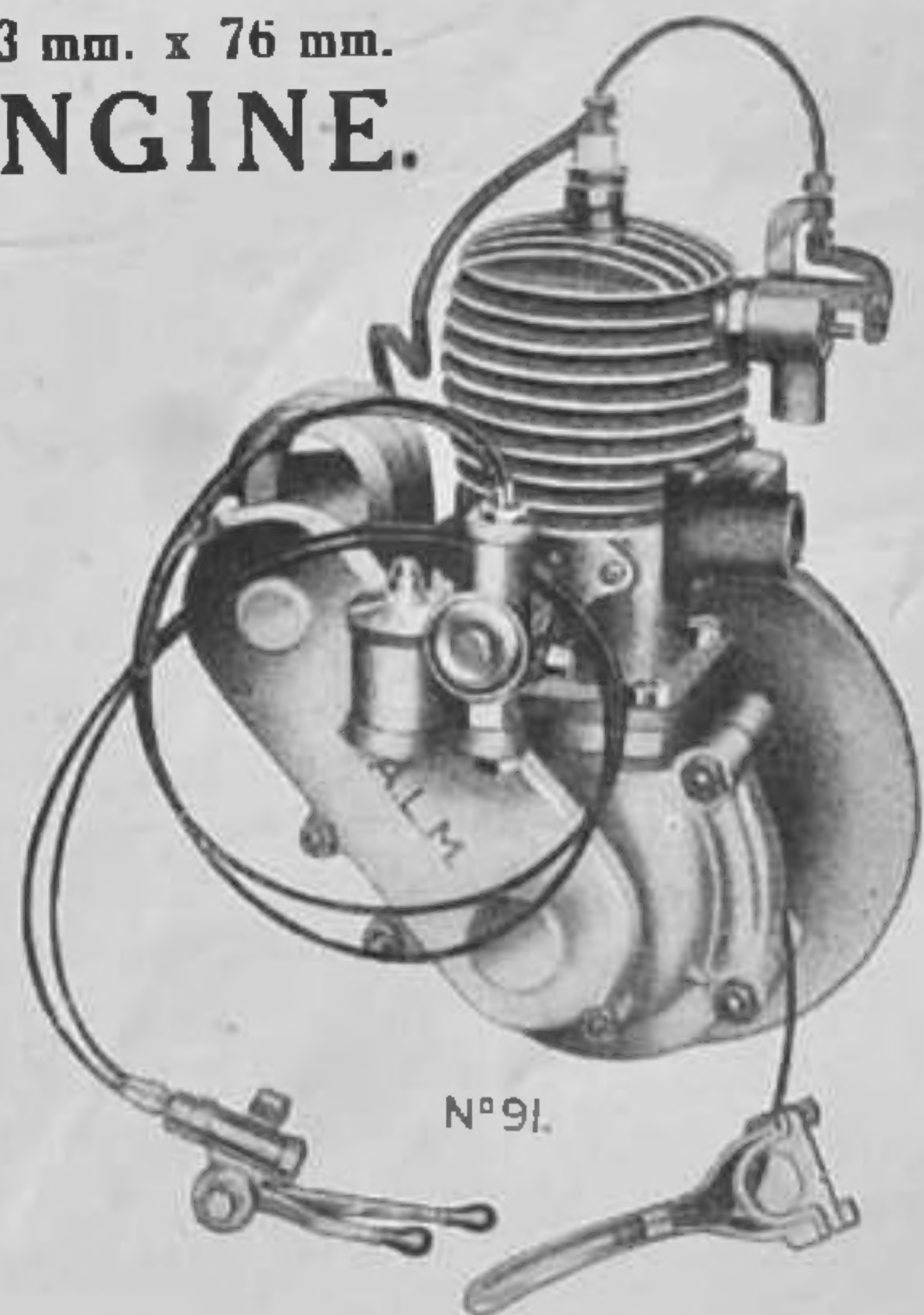
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